

# Introduction

The LA DOTD Aviation Section has identified sixty-nine (69) public-use airports (7 air carrier and 62 general aviation) that they recognize as being eligible for state funding. The FAA's National Plan of Integrated Airport Systems (NPIAS) recognizes forty-eight (48) of the existing 62 general aviation airports in Louisiana, which are eligible for federal as well as state funding. Aviation Trust Funds are used for the required state match to FAA funds.

The LA DOTD Aviation Section carries out its policies and programs in accordance with the Louisiana Administrative Code, Title 70 - Transportation, Part IX - Intermodal Transportation. The Aviation Section currently consists of 12 staff positions that are indicated as the following:

Aviation Director	Airway Systems Manager
Assistant Aviation Director	Aviation Safety Compliance Officer
Program Manager – Northwest Region	Assistant Program Manager
Program Manager – Northeast Region	Administrative Assistant
Program Manager – Southwest Region	
Program Manager – Southeast Region	

A breakdown of the current program manager's regions can be found on the next page as well as **on the enclosed CD**. For revisions or questions about this manual please contact us at:

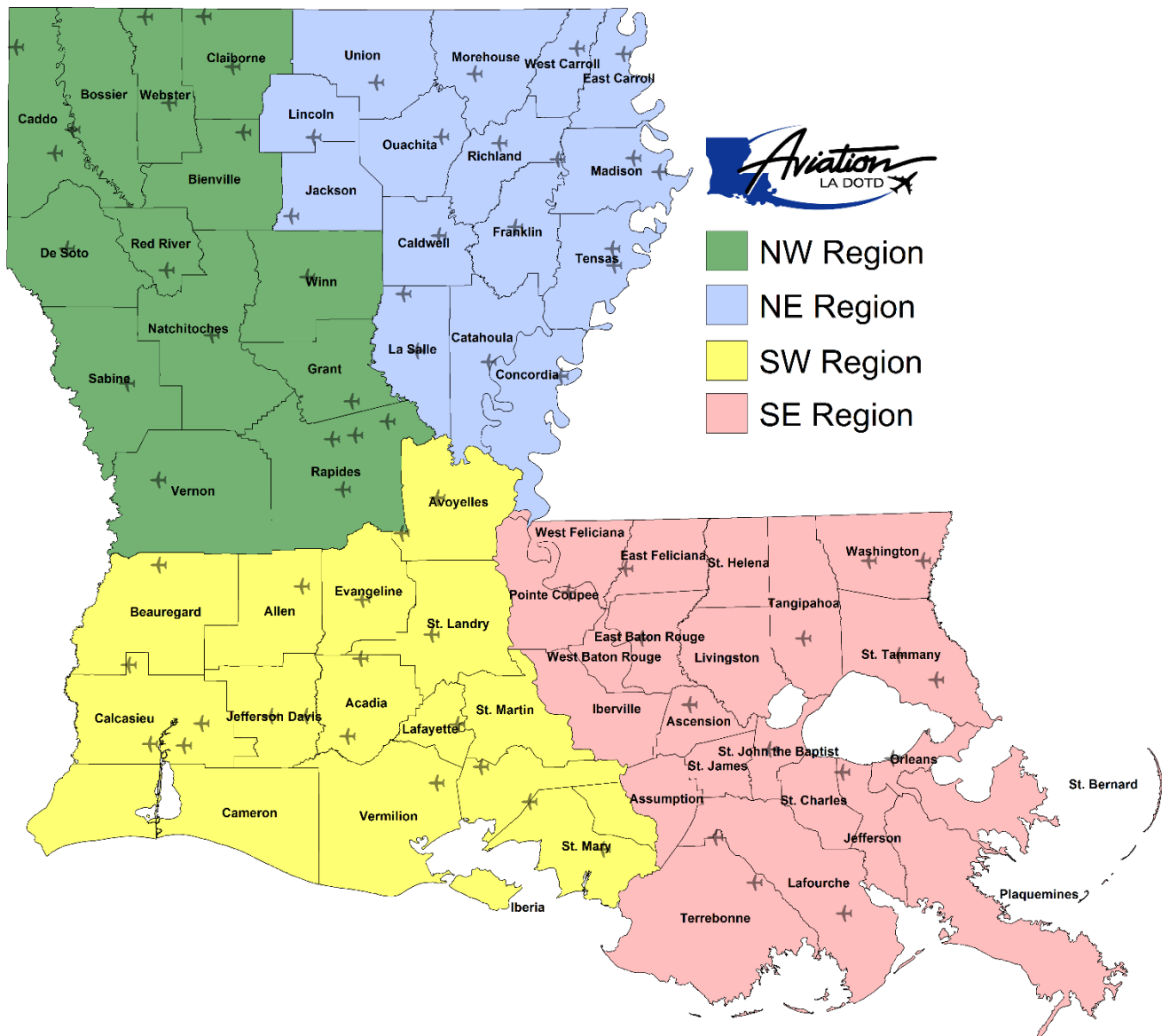
Louisiana Department of Transportation and Development  
Aviation Section – 88  
P.O. Box 94245  
Baton Rouge, LA 70804-9245  
Phone: (225) 379-3050  
Fax: (225) 379-3072

## **LA DOTD Mission**

To deliver transportation and public works systems that enhance the quality of life and facilitate economic growth.

## **Aviation Section Mission**

Our mission is to continue to improve our aviation infrastructure to insure a safe, modern and well managed system of airports which provides convenient and efficient access to the state for tourism, commerce, industrial interest, recreation and economic development and continually modernize the state's public airports to meet the changing needs of the aviation community.



# Table Of Contents

## ➔ CHAPTER 1 – The Consultant Selection Process

Advertisement .....	1-2
Required Documentation to LA DOTD Aviation Section .....	1-3

## ➔ CHAPTER 2 – Airport Operational Revenue

Revenue .....	2-1
Leases .....	2-2

## ➔ CHAPTER 3 – Funding Airport Projects

Project Application Process .....	3-5
Grant Application Process .....	3-9

## ➔ CHAPTER 4 – Airport Real Estate

Lease Agreements.....	4-1
Lease Terms and Standards .....	4-3
Release of Airport Property .....	4-4

## ➔ CHAPTER 5 – Airport Layout Plans

Airport Layout Plan Drawing .....	5-3
Airport Airspace Drawing .....	5-9
Airport Property Map .....	5-12

## ➔ CHAPTER 6 – Airport Maintenance

GA Maintenance Program Eligible Items.....	6-2
--	-----

## ➔ CHAPTER 7 - Pavement Maintenance

Portland Cement Concrete (PCC) Pavement .....	7-6
Bituminous Pavement .....	7-12
Inspection Procedures .....	7-18

## ➔ CHAPTER 8 - Airport Navigational Aids

NAVAIDS .....	8-1
Local Altimeters .....	8-7

---

AWOS-3 .....	8-7
NADIN.....	8-9
<hr/>	
➔ <b>CHAPTER 9 – Airport Zoning</b>	
<hr/>	
Airspace Protection.....	9-2
Airport Zoning Ordinance .....	9-7
<hr/>	
➔ <b>CHAPTER 10 – Airspace Obstructions</b>	
<hr/>	
Notice of Construction.....	10-1
Obstruction Marking and Lighting .....	10-6
Terminal Instrument Procedures.....	10-9
<hr/>	
➔ <b>CHAPTER 11 - Vegetation Management</b>	
<hr/>	
Vegetation Control.....	11-5
<hr/>	
➔ <b>CHAPTER 12 - Wildlife Hazard Management</b>	
<hr/>	
Bird Hazards and Landfills .....	12-4
<hr/>	
➔ <b>CHAPTER 13 - Runway and Taxiway Marking</b>	
<hr/>	
Runways.....	13-1
Taxiways.....	13-4
Holding Position Markings.....	13-5
<hr/>	
➔ <b>CHAPTER 14 – Airport Operations Manual</b>	
<hr/>	
Airport Operations Manual Sample.....	14-2
<hr/>	
➔ <b>CHAPTER 15 - Airport Fueling</b>	
<hr/>	
Types of Aviation Fuel .....	15-1
Minimum Inspections .....	15-9

# Chapter 1 - The Consultant Selection Process

## Introduction

### Requirements

There are several Louisiana State and Federal regulations that deal with the procurement of architectural and engineering services:

LA R.S. 38:2318.1 (A) explains the process by which political subdivisions shall select firms to provide engineering and architectural services:

*"It is the policy of the state of Louisiana, its political subdivisions, and agencies to select providers of design professional services on the basis of competence and qualifications for a fair and reasonable price. Neither the state nor any of its political subdivisions or agencies may select providers of design services wherein price or price-related information is a factor in the selection."*

LA R.S. 2:1 (24), an airport sponsor is considered a political subdivision:

*"Sponsor" means any state agency, city, town, parish, airport authority, or other political subdivision which owns, leases, or controls any airport, landing field, landing strip, seaplane base, helipad, or aid to air navigation."*

Also, for airports receiving grants from the Federal Aviation Administration (FAA) through the Airport Improvement Program (AIP), compliance with numerous statutes and regulations requires the use of qualifications based procedures when procuring consultant services.

USC Title 49>Subtitle VII.Part B>Chapter 471>Subchapter I>Section 47107: Project Grant Application Approval Conditioned on Assurances About Operations:

*"Each contract and subcontract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping, and related services will be awarded in the same way that a contract for architectural and engineering services is negotiated under chapter 11 of title 40 or an equivalent qualifications-based requirement prescribed for or by the sponsor."*

USC Title 40>Subtitle I>Chapter 11: Selection of Architects and Engineers requires:

*“The policy of the Federal Government is to publicly announce all requirements for architectural and engineering services and to negotiate contracts for architectural and engineering services on the basis of demonstrated competence and qualification for the type of professional services required and at fair and reasonable prices.”*

CFR Title 49>Part 18>Subpart C>Section 18.36 (t) requires:

*“FHWA, UMTA, and Federal Aviation Administration (FAA) grantees and subgrantees shall extend the use of qualifications-based (e.g., architectural and engineering services) contract selection procedures to certain other related areas and shall award such contracts in the same manner as Federal contracts for architectural and engineering services are negotiated under Title IX of the Federal Property and Administrative Services Act of 1949, or equivalent State (or airport sponsor for FAA) qualifications-based requirements. For FHWA and UMTA programs, this provision applies except to the extent that a State adopts or has adopted by statute a formal procedure for the procurement of such services.”*

In addition to Federal statutes and regulations, airport sponsors who receive federal grants from the FAA also agree to adhere to certain conditions when accepting the funding agreements:

Advisory Circular 150/5100-14D “Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects” is mandatory as part of the sponsor’s grant assurances (as referenced in USC Title 49 above). According to the Application section of this document:

*“Airport sponsors must use qualifications based selection procedures in the selection and engagement of consultants in the same manner as Federal contracts for architectural and engineering services negotiated under Title IX of the Federal Property and Administration Services Act of 1949, or equivalent State/sponsor qualifications based requirements.”*

Grant Assurance 32 requires the sponsor to adhere to the following for Engineering and Design Services:

*“It will award each contract, or subcontract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administration Services Act of 1949 or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.”*

The AIP Sponsor Certification for Selection of Consultants is also submitted with a sponsor's federal grant application. Through this document the sponsor certifies that consultant services have been procured as required, and it becomes part of the funding agreement upon acceptance of the grant by the sponsor.

Therefore, all Louisiana airport sponsors are required by law to select these services based on "competence and qualifications for a fair and reasonable price", which is often referred to as a qualification based selection. In addition, airport sponsors receiving Federal grants must comply with the qualification based selection system described in the Advisory Circular, unless equivalent State/local requirements exist.

### **Development of a Process**

As stated above, airport sponsors who receive grants through the Airport Improvement Program (AIP) agree to procure consultant services in accordance with the guidelines established by the FAA in Advisory Circular 150/5100-14. The guidance in the Advisory Circular allow for a sponsor to establish "equivalent" requirements for procuring consultant services in lieu of the requirements contained in the Circular.

This Chapter describes a selection system developed and recommended by LADOTD Aviation Section for use by airport sponsors in selecting an airport consultant for airport development projects, based upon the guidance provided in AC 150/5100-14D; specifically, the guidelines for a formal consultant selection were used. Use of this system assures the sponsor of compliance with not only State requirements, but with Federal Aviation Administration regulations and assurances as well. The various forms and documents referred to in the LADOTD Aviation Section system can be found in Appendix A, and are also available through the LADOTD Aviation Section website and the LADOTD Aviation Section office.

An airport sponsor may elect to use its own system of selecting an airport consultant; however, the sponsor should ensure that its system is in compliance with all Federal and State requirements. Failure to do so could result in the loss of Federal and/or State funding for the sponsor. The recommended LADOTD Aviation Section selection system provides a good basis for comparison and evaluation of a sponsor's own system. Should the sponsor elect to proceed with its own selection system, it is **highly** recommended that LA DOTD Aviation Section first review the sponsor's system to ensure compliance.

## **Step 1 – Determine Type of Selection**

The first step in the consultant selection process is for the airport sponsor to determine what type of selection it is seeking. Will services be procured for a single project, or will the sponsor be seeking a consultant to provide services for multiple projects? A brief summary of the two different types follows below. Before determining which type of selection to undertake, it is always recommended that the sponsor's LADOTD Aviation Program Manager be consulted for guidance as to the recommended course of action.

**A. Single Project Selection**

This type of selection is self-explanatory; the airport sponsor will be advertising for consultant services for a single project. Any subsequent projects the sponsor wishes to procure services for must be advertised separately.

**B. Multiple Project Selection**

This type of selection, as the name suggests, involves the procurement of consultant services for multiple projects. The type of contracts involved with this type of selection often include a “Master Services Agreement” (MSA) which contains the terms and conditions of the agreement, and supplemental agreements or work orders for each individual project which contain the fees associated with that project. Although a MSA may include all projects for which services have been advertised, fees must still be negotiated on a project-by-project basis, as discussed further in this Chapter. All projects procured by a multiple-project selection must be specific in description rather than general.

When determining which type of selection to proceed with, the airport sponsor should discuss its five (5)-year Capital Improvement Program (CIP) with its LADOTD Aviation Program Manager. The only projects that should be included in the advertisement for services are those which can reasonably be expected to receive funding within a five (5)-year period, and again the project descriptions should be specific rather than general. Once the sponsor determines which projects will be included in the advertisement for services, proceed to **Step 2**.

## **Step 2 - Form a Consultant Selection Committee**

Once the sponsor has decided which projects it wishes to procure services for, the next step in the process is for the airport sponsor to establish a consultant selection committee. This is the committee that will be responsible for developing a scope of work for the services contract being advertised, developing the selection criteria, creating an advertisement requesting qualifications from interested firms, receive and review statements of qualifications, and making a final recommendation to the airport sponsor based on the committee’s review of the firms.

When appointing members to the selection committee, the sponsor should make several considerations: the ideal committee size should be three (3) to five (5) members; at least one committee member should be an engineer, airport planner, or other aviation professional knowledgeable of the services required; the committee should be appointed based on an established administrative policy of the airport’s governing body; **no selection committee member shall be involved directly or indirectly with any firm competing for the required services**. Once the committee is appointed, each member is required to complete and sign the Consultant Selection Committee Form. This form acknowledges that the individual committee members understand and intend to follow all applicable rules concerning the consultant selection process.



## Step 3 - Establish Selection Criteria and Importance

The first action of the consultant selection committee should be to establish the selection criteria for the project(s) for which services are being advertised. There are basic criteria that should be included in any standard procurement; these basic criteria can be found on the form recommended by LADOTD Aviation for sponsors to receive statements of qualifications, the Federal Standard Form 330 (SF 330). The selection committee should review the SF 330 to determine it provides for adequate selection criteria for the airport sponsor's projects. Additional criteria may be added to the form, but the selection committee must contact LADOTD for review prior to the inclusion of any additional criteria. **Guidance on establishing and scoring special criteria can be found in Section H of the Statement of Qualifications Rating Worksheet, which is located in Appendix A-3.**

After establishing the selection criteria, the selection committee should then establish the individual importance of each of the criteria. The committee should consider any unique conditions that exist at the airport that may increase the importance of certain aspects of a consultant's qualifications in relation to the rest of the firm's qualifications. The SF 330 places each of the selection criteria into separate sections; the committee will incorporate the importance of each of the criteria in the selection process by assigning a "weight" to each section/criteria. The weight will be a numerical value from 1 (being the lowest) to 5 (being the highest), and will be used to increase/decrease the importance of that section in relation to the other sections. This will also convey to the firms which criteria are most important to the sponsor. Some sections of the form (such as the first four sections of Part I and the entirety of Part II) are not given a numerical value, but rather are given a "pass" or "fail" mark based on whether the applicant provided all information requested.

## Step 4 - Create Your Request for Consultant Qualifications (RFQ)

Now that the scoring system by which the consultants' qualifications will be evaluated has been established, the next step is to create a request for qualifications (RFQ). The RFQ is an advertisement that announces the airport sponsor's intention to enter a contract with a qualified consultant firm for services related to its grant-funded projects. Development of the RFQ is one of the most important steps in the consultant selection process, so the selection committee or airport sponsor should contact LADOTD for guidance during the process of developing the RFQ. A sample RFQ can be found in Appendix A-5 for further guidance on the development of the advertisement. **The airport sponsor/selection committee should contact LADOTD for review of the RFQ prior to the advertisement's publication.**

The RFQ is one of them most vital steps in the process of selecting an airport consultant, as it is the means by which the airport sponsor informs interested consultants of the projects the sponsor

is planning to implement in the near future. It also informs the potential firms of the qualifications which the sponsor is seeking in order to provide services for those projects. For this reason, the selection committee **must** ensure that the RFQ clearly defines the following:

- Project descriptions and projected timetable for implementation of those projects
- Estimated construction costs (if applicable)
- Unique project features
- Explanation of the process which will be used to select the successful firm
- Instructions on how to submit qualifications (SF 330) and where the form may be obtained
- Technical disciplines required
- Weighting factors for criteria
- Deadline for receipt of responses
- Address for submission of response
- Contact person for additional project information

The objective of the consultant selection process is to select the consultant most qualified to provide services to the airport sponsor at a fair and reasonable cost. Any omission or error involving the key components listed above could result in undesirable selection results and/or a finding by FAA or LADOTD that improper selection methods were used. Such a determination can result in suspension of funding to airport projects until the problem is corrected, which could result in the loss of funding opportunities for the airport sponsor. **Therefore, as part of this process the selection committee/airport sponsor should contact LADOTD Aviation Section for final review and comment on the RFQ before publication.**

## **Step 5 – Submit Pre-Advertisement Document Transmittal Form**

Prior to the publication of the RFQ, the selection committee must provide LADOTD Aviation Section with documentation showing that the process is being conducted in accordance with regulations. The documentation required in the Pre-Advertisement Document Transmittal ensure that a selection committee has been formed, proper selection criteria has been established by the committee, and that a proper RFQ has been developed. This transmittal should be done when submitting the RFQ to LADOTD for review.

The following documents are required in the Pre-Advertisement Document Transmittal:

- Completed Consultant Selection Committee Member Form for each member of the selection committee
- Weights for each section of the SF 330, as well as any additional criteria added to the form
- Proposed RFQ

LADOTD will respond in a timely manner to confirm that all documentation has been reviewed, at which point the airport sponsor should then publish the advertisement.

## Step 6 - Advertise Your Request for Qualifications

The sponsor should advertise in publications where the most qualified firms will see the advertisement, and for a period of time long enough to ensure as many potential firms will view the advertisement as possible. In addition to these considerations, there are also **requirements** associated with the publication of the RFQ:

- The advertisement **must** appear at least once time in the official State Journal, the Baton Rouge Advocate,
- The advertisement should also appear in the local newspaper where the project(s) are located
- Must appear at least 14 days prior to the deadline for the receipt of responses (although LADOTD recommends at least 30 days)

Also, if the sponsor intends to request proposals from firms after statements of qualifications have been received and evaluated, the RFQ must clearly state that the sponsor reserves the right to do so. Failure to clarify this in the advertisement could lead firms to believe that the final selection will be based solely on statements of qualifications and cause confusion.

## Step 7 – Receive Statements of Qualifications

The consultants responding to the advertisement will send a completed Statement of Qualification (SOQ), which is the SF 330, demonstrating the firm's qualifications and experience for the projects listed in the advertisement. A designated person should clearly mark the date and time of receipt of each unopened submittal envelope. Any SOQs received after the advertised deadline will remain unopened and will be marked "Disqualified - Received (Date) (Time)". All other SOQs will remain unopened until the Selection Committee begins its evaluation process.

## Step 8 - Evaluate Statements of Qualifications

Each member of the selection committee shall review and evaluate each statement of qualifications using two forms developed by LADOTD Aviation Section for this selection system (**both of which can be found on the enclosed CD or from LADOTD Aviation Section**):

### Statement of Qualifications Rating Worksheet

The Statement of Qualifications Rating Worksheet guides the reviewer through the process of evaluating each section of the SF 330, advising the reviewer on what he/she should be looking for in the information/qualifications provided and how the items in each section should be

scored. The committee should note the guidelines pertaining to incomplete statements of qualifications and the disqualification of applications.

#### Statement of Qualifications Rating Sheet

The Statement of Qualifications Rating Sheet is the actual document used by the committee members to document a consultant's scores and will provide the committee with the basis by which to rank the firms once all reviews are complete. The Statement of Qualifications Rating Worksheet must be used in conjunction with this document in order to properly evaluate and score the consultant's SOQ.

Once all Statement of Qualifications Rating Sheets have been completed, the results are compiled on the **Consultant Qualifications Ranking Sheet**.

## **Step 9 – Prepare Pre-Selection Short-List**

Once all Statements of Qualifications have been properly evaluated by the selection committee, the committee will then prepare a Pre-Selection Short-List of the highest-ranked, best-qualified firms. With adequate response to the RFQ, the typical Pre-Selection Short-List should consist of three (3) to five (5) firms. The selection of the firms to this list is based on their final overall score as indicated by the Consultant Qualifications Ranking Sheet.

After preparing the Pre-Selection Short-List, the next course of action will depend on whether or not the committee will be requesting proposals from the Short-List firms. For single-project procurements that involve minimal complexity, the results of the statement of qualifications may be sufficient. For a multiple-project procurement involving one or more medium to large-scale projects, further evaluation may be needed. The airport sponsor should contact LADOTD Aviation Section for guidance on which approach is necessary. However, as stated in Step 6 if the committee elects to proceed with requesting proposals, it must have been clearly stated in the original advertisement that the sponsor reserves the right to further evaluation beyond the statements of qualifications.

If the selection committee will be making its recommendation based only on its review of the statements of qualifications, proceed to **Step 14**.

If the selection committee will be proceeding with further evaluation of the Pre-Selection Short-List firms, the committee should proceed to **Step 10**.

## Step 10 – Develop Request for Proposals

If the selection committee has decided that further evaluation of the firms on the Pre-Selection Short-List is necessary before making a final determination, then the next step in the selection process is to develop a request for proposals (RFP). The RFP is a document requesting proposals from firms by asking that the firm to submit a proposed method of accomplishing the referenced projects. This usually includes, but is not limited to:

- Proposed project schedule of major tasks and target completion dates
- The firm's technical approach to the project(s)
- A brief example of the consultant's capability, training, and experience to carry out value engineering (when included in the original advertisement).
- Recommended funding approach to completing the referenced projects

LADOTD Aviation has developed standard forms to be used for development of RFP's, as well as the review and evaluation of the proposals received from the qualified firms. The **Request for Proposals Rating Worksheet** and **Request for Proposals Rating Sheet** are to be used to review and score proposals received in response to the RFP (**both are available in Appendix A-8 and A-9, respectively, and through LADOTD Aviation Section**). A sample RFP is also available (Appendix A-10). Because the RFP involves much more detail than the request for qualifications, the selection committee and airport sponsor are highly recommended to coordinate with LADOTD Aviation Section in developing the RFP. The LADOTD Aviation Section should review the RFP prior to being sent to the Short-List firms.

The request for proposals must clearly explain the preferred format to be used by the firms in submitting proposals. Proposals can be received in a variety of forms, such as presentations, interviews, written proposals, or any combination of such. While the sample RFP provides a basic template for any format, once a format is chose the following elements should be added to the template:

- For interviews, the RFP must provide a list of topics that may be covered in the interview. The RFP should also give the length of time expected for each interview.
- For presentations, the RFP must specify whether the format of the presentation will be formal or informal. The choice may be left to the firms, however this must be clearly stated in the RFP
- For written proposals, the RFP must provide the desired size of the document (i.e., number of pages).

The RFP must be tailored to the type of procurement being taken on by the airport sponsor, as well as based on the specific projects for which services are being procured. For a single-project procurement, this may be by simply asking the firm for their recommended approach and how they would apply their resources toward accomplishing the project. For a multi-project procurement, the airport sponsor may want the firm to demonstrate their planning capability via a

recommended schedule of implementation of the projects, or even by submitting a recommended Capital Improvement Plan of its own in addition to a project-by-project schedule and approach.

## Step 11 – Submit Pre-RFP Document Transmittal Form

Prior to sending the request for proposals to the Short-List firms, the selection committee must provide LADOTD Aviation Section with documentation that the process is being conducted in accordance with regulations. The documentation required in the Pre-RFP Document Transmittal ensures that the rating of the firms was conducted properly, the Short-List firms were selected based on ranking and in accordance with the advertised process, and that a proper RFP has been developed.

The following documents are required in the Pre-RFP Document Transmittal:

- Completed Consultant Rating Sheet from each committee member
- The completed Consultant Qualifications Ranking Sheet
- Request for proposals document developed by the Committee
- Short List of Qualified Firms
- Draft RFP

LADOTD will respond in a timely manner to confirm that all documentation has been reviewed, at which point the airport sponsor should then proceed to **Step 12**.

## Step 12 - Notify All Respondents

The next step in the process is to notify the firms of the status of their application. The notification process proceeds as follows:

- The Short-List firms will be notified that they are on the Short-List of firms for further evaluation. Included in the notification will be the request for proposals, which will describe the criteria to be used for evaluation and the guidelines as to how to submit/present this information to the committee. The RFP sent out to the firms **must** be identical, as the information requested of each as well as the method of submittal must be very clearly stated to the firms.
- All other firms must be notified that they were not selected for further evaluation.
- Sample notification letters can be found in Appendix A-13 to A-16.

## Step 13 – Receive Proposals

Once all proposals have been received, each committee member must review and score each proposal using the request for proposals Rating Worksheet and Request for Proposals Rating Sheet, respectively. Whether reviewing a written proposal or presentation by the firm, the committee members shall review and rate each firm according to how well the firm's proposal demonstrates their qualifications for the proposed project(s). The evaluation should also take into consideration the information requested and format the firm was instructed to follow in the RFP.

Once all proposals have been scored by each committee member, each committee member's total score for each firm's proposal must be entered into the Consultant Proposal Rankings Sheet (**found in Appendix A-12**), along with their total cumulative score from the Consultant Qualifications Ranking Sheet. The resulting total score shall determine the consultant's final ranking.

## Step 14 – Make Recommendation to Airport Sponsor

After the committee has reviewed all qualifications and proposals submitted by firms in response to the request for qualifications (and if applicable, request for proposals), it is time to make a recommendation to the airport sponsor based on the final ranking of the Pre-Selection Short-List. The final ranking shall be based on the firms' final score as shown on the Consultant Qualifications Ranking Sheet, or if applicable, the Consultant Proposal Rankings Sheet.

The selection committee shall then provide the airport sponsor its final recommendation of the top-ranked, with the remaining Pre-Selection Short List firms ranked according to their final score as well. Once the recommendation is accepted by the airport sponsor, proceed to **Step 15**.

## Step 15 - Notify All Respondents

The next step in the process is to notify the firms of the status of their application. The notification process proceeds as follows:

- The top-ranked firm will be notified of its selection by the airport sponsor, and to expect a request for a fee proposal.
- The Short-List firms will be notified of the final ranking of firms, and that they may be contacted for negotiations if the negotiations with the top-ranked firm should fail.
- If the selection was made based on Statements of Qualifications only, then all other unsuccessful firms will need to be notified as well (unless notified as part of Step 12).
- A sample notification letter can be found in the appendix.

## Step 16 – Request Fee Estimate and Prepare Independent Fee Estimate

- A. **Request Independent Fee Estimate**: After accepting the recommendation of the Consultant Selection Committee, the airport sponsor will then direct the top-ranked firm to prepare a fee estimate for the services advertised. This step of the process will vary depending on if the sponsor advertised for one project, or for multiple projects:
1. **Single Project**: If the sponsor advertised for a single project, the sponsor shall direct the top-ranked firm to prepare a fee estimate for that project.
  2. **Multiple Projects**; if the sponsor advertised for multiple projects, the sponsor shall direct the top-ranked firm to prepare a fee estimate for the **next project only**.

Typically, the sponsor should expect a turnaround time of approximately 2-4 weeks from the date the firm is notified to the receipt of the fee proposal. While the fee estimate is being prepared by the firm, the sponsor should simultaneously prepare an Independent Fee Estimate

- B. **Prepare Independent Fee Estimate**: FAA requires a fee analysis of some type for all engineering contracts. The type of fee analysis will largely depend on the type of project and proposed scope of services. For assistance in determining the appropriate level of fee analysis, the sponsor should contact their LADOTD Aviation Section program manager for further guidance. The analysis will be used as the basis for negotiating with the number one ranked firm after the firm's fee estimate has been received. For projects which will not be receiving a FAA AIP grant, it is still necessary to consult your LA DOTD Aviation Section Program Manager.

## Step 17 - Negotiations

Negotiations should begin immediately after the selected consultant's fee proposal is received. The sponsor should reference the independent fee analysis when evaluating the firm's fee proposal. If for some reason a satisfactory contract cannot be negotiated with the number one ranked firm, the negotiations should be terminated. Then, depending on whether or not the sponsor advertised for services for multiple projects, one of the two following actions will be taken:

- A. **Single Project**: If negotiations for the project fail, the sponsor will conduct the negotiation process as described in this step with the next highest-ranked firm in sequence with the final ranking until a satisfactory contract can be negotiated. Once a firm is passed over during the negotiating process as a result of failure to negotiate a contract, , that firm will be removed from the list and no further negotiations with that firm will take place.



- B. **Multiple Projects:** If the negotiations for the **first** project have failed, the sponsor will conduct the negotiation process as described in this Step with the next highest-ranked firm in sequence with the final ranking until a satisfactory contract can be negotiated. If negotiations for any **subsequent** project have failed, the sponsor **must re-advertise** for the services for **that project**. Once a firm is passed over during the negotiating process as a result of failure to negotiate a contract, that firm will be removed from the list and no further negotiations with that firm will take place for **that particular project**.

## Step 18 - Prepare Draft Contract and Record of Negotiations

Once an agreement is reached with a firm based on fees and a scope of services, a draft contract between the sponsor and the firm should be prepared. The LA DOTD Aviation Section and/or the FAA will review the unexecuted contract and forward comments to the local airport sponsor.

## Step 19 – Submit Pre-Contract Document Transmittal

Prior to the execution of the contract between the airport sponsor and the consultant firm, the sponsor must provide LADOTD Aviation Section with documentation that the process is being conducted in accordance with regulations. The documentation required in the Pre-Contract Document Transmittal ensures that fees were negotiated in accordance with proper procedure (using a properly prepared Independent Fee Estimate as applicable) and that a proper contract for services has been drafted. This transmittal should be done when submitting the RFQ to LADOTD for review.

The following documents are required in the Pre-Contract Document Transmittal:

- Proof of advertisement (If not previously submitted)
- Completed Statement of Qualifications Rating Sheets (if not previously submitted in Step 10)
- Completed Consultant Qualifications Ranking Sheet (If not previously submitted in Step 10)
- Completed RFP Rating Sheets (if applicable)
- Completed Consultant Proposals Ranking Sheet (If applicable)
- Notification Letters to Firms (as applicable)
- Letter of Recommendation to Award to Selected Firm
- Independent Fee Estimate (if applicable)
- Record of Negotiations
- Draft Engineering Services Agreement

LADOTD will respond in a timely manner to confirm that all documentation has been reviewed, at which point the airport sponsor should then proceed to **Step 20**.

## Step 20 - Execute the Contract

Upon FAA and/or LA DOTD Aviation Section review and comment on the draft contract, the local airport sponsor and the consultant will execute the contract and forward it to their respective LA DOTD Aviation Section Program Manager.

## References

- Louisiana Law Revised Statutes Title 2, “Aeronautics”
- Louisiana Law Revised Statutes Title 38, “Public Contracts, Works, and Improvements”
- United States Code Title 40, “Public Buildings, Property, and Works
- United States Code Title 49, “Transportation”
- United States Code of Federal Regulations Title 49, “Transportation”
- Federal Aviation Administration Advisory Circular 150/5100-14D “Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects”

# Chapter 2 - Airport Operational Revenue

## Introduction

This chapter outlines some guidelines in keeping and maintaining records of budgets, operating costs, and revenue sources.

## Revenue Sources

General aviation airports have a number of sources in which to produce self generating revenue. Some typical general aviation airport revenue sources can be outlined as follows:

### 1. Airport Sponsor / Fixed Based Operator Fees

- Ground rental fee (square feet/year)
- Hangar rental (square feet/year)
  - T-Hangar rate
  - Large hangar rate
  - Small hangar rate
- Ramp fees
  - Monthly tie-down
  - Transient aircraft tie-down
- Fuel Flowage fees
- Agricultural Operators fees

### 2. Land

- Industrial park rental
- Farming activities

### 3. Terminal Building

- Counter space (square feet/year)
- Office space (square feet/year)

Some expenses that general aviation airports incur can include the following:

- |                                  |                               |
|----------------------------------|-------------------------------|
| • Administrative                 | • Other Equipment Maintenance |
| • Building Maintenance           | • Roads/Parking Maintenance   |
| • Lighting / NAVAID Maintenance  | • Utilities                   |
| • Grounds Maintenance            | • Line Services               |
| • Pavement Maintenance           | • Insurance                   |
| • Aviation Equipment Maintenance |                               |
| • Security                       |                               |

## Leases

Airport districts, airport authorities, and other political subdivisions that operate airports or landing fields may lease spaces or areas on those airports. The types of leases at general aviation airports are usually tailored to each specific airport and in most cases are all different. As per the Louisiana Revised Statutes, Title 2, all proposed airport lease agreements must be reviewed and approved by the LA DOTD Aviation Section prior to their execution. An **example of a typical airport lease and operating agreement** is located **on the enclosed CD**. For more information on lease terms and agreements, please refer to **Chapter 4 - Airport Real Estate**.

## Rates and Charges

The rates and charges vary by location and types of operations. Air Carrier (AC) airports typically charge landing fees based on the aircraft's landing weight, whereas most General Aviation (GA) airports in Louisiana do not charge landing fees. However, there is no rule saying that GA airports can not charge landing fees. Other fees that are common to both AC and GA airports include, but are not limited to: Hangar fees, Ramp Tie-Down fees, Fuel Flowage fees and Terminal Building rental fees. Rates and charges should be fair and reasonable in comparison with industry standards. Fees for leases of ramp space, hangars and terminal buildings must be fair market value.

## References

Louisiana Revised Statutes, Title 2 Aeronautics

# Chapter 3 - Funding Airport Projects

## Introduction

This chapter will outline the recordkeeping requirements established by the Federal Aviation Administration (FAA) for the Airport Improvement Projects (AIP) program and give some examples of possible revenue sources.

In 1989 there was an addition to the Louisiana Constitution creating what is known as the Aviation Trust Fund. The purpose of the Aviation Trust Fund is to fund improvements to Louisiana's public-use airports. The LA DOTD Aviation Section is responsible for administering the State's aviation program through the ATF.

Traditionally, the United States Department of Transportation, through the Federal Aviation Administration (FAA), has been a major source of funding eligible airport development projects. With the establishment of the Louisiana Aviation Trust Fund (ATF), the State has also become a source of assistance to local airport agencies. The Louisiana Department of Transportation and Development (LA DOTD) Aviation Section is responsible to the Legislature for the distribution of the ATF and to assure State and Federal procedures are followed.

The LA DOTD Aviation Section assists airport sponsors in the development and submittal of airport projects for funding that meet the provisions of the section's Aviation Needs and Project Priority Program. During the beginning stages of developing an airport project, the airport sponsor should contact the LA DOTD Aviation Section to assure compliance with FAA and State goals for aviation.

An airport should consider searching for alternate funding from agencies such as the Federal Economic Development Agency, State Economic Development Agency, Transportation Security Administration, Bonds, as well as local funding sources.

## Federal Recordkeeping Requirements For AIP Projects

Airport sponsors which receive Airport Improvement Program (AIP) funds must keep all project accounts and records that fully disclose the amount of the grant, the total allowable costs of the project for which the grant was given, and the nature and amount of any other funds used for the projects. An allowable project cost is a direct or indirect cost that is paid by the sponsor. *Direct costs* are those costs that can be specifically identified with a particular cost objective. *Indirect costs* are allowable only if the sponsor has an approved cost allocation plan.

Airport sponsors should establish and maintain adequate records in four main areas:

1. Construction and Project Improvement Costs

2. Architectural/Engineering/Consultant Costs
3. Acquisition of Land, Structures, Right-Of-Way, and Relocation Assistance Costs
  - a. Acquisition requires property to be recorded at the courthouse.
4. Administrative Costs

## Construction And Improvement Costs

Construction work on an airport can either be performed by a *contractual method* or by an *airport sponsor's force account*. *Contractual construction* means that all construction work must be accomplished by contract unless the FAA determines otherwise. A *sponsor's force account* involves construction work that is performed by the airport sponsor's own labor force or with the labor force of another public agency. The sponsor's force account must have the FAA's written approval prior to any work performance.

The following documents should be kept when claiming construction and project improvement costs that are performed under contract:

- Construction contract and all amendments.
- Invoices for all work performed including all detailed supporting data.
- Evidence of all payments including vouchers, and canceled checks.
- Any charges for liquidated damages.
- The audit file when the cost of the construction will be a reimbursable type contract. This file should include the scope of the audit and the extent of the verification of the work performed.
- A supplemental agreement with all signatures should be kept if the amendment results in an overrun or underrun of 25% or more on a bid item that is 10% or more of the total contract.
- Records for materials or equipment that were salvaged under the contract as a result of removal or replacement, or the removal and storage of existing facilities and the value of each item.
- Sales tax refund information, if applicable.
- Final inspection report showing the acceptance of the work performed under the project, and all records of any dispositions or corrections of all unsatisfactory work.

To claim force account construction costs, an airport sponsor should keep the following information:

1. Labor Costs: Daily time reports of each employee describing actual work performed, the hourly rate and the total hours; project account; payrolls for each pay period during all work performed on the project; canceled payroll checks; and employees' earnings records.
2. Fringe Benefits: Payroll tax returns; insurance policies; earned premium audits; applicable invoices; pension plan (each employee's contribution if paid); recognized holidays; and vacation and sick leave policy.

3. Equipment Usage Charges: Daily equipment operating reports, showing the name of the operator, the hours operated, and distribution to work orders; any rates (how they were determined; whether they were uniformly charged to all work of the sponsor; and the FAA approval of those charges); equipment operating cost accounts.
4. Material Costs: All vendor's invoices; applicable purchase orders; freight bills; receiving reports; perpetual inventory records; the method of pricing issues from stores' requisitions; stores' returns; production cost reports; depletion or royalty expense; weight tickets; physical inventories; and production cost accounts.

## Architectural/Engineering/Consultant Costs

These costs are normally obtained in the same way construction and project improvement costs are obtained: contractual, and by sponsor's force account. All contracts for engineering and planning services and force account proposals must be sent to the FAA for approval prior to the start of any contract or force account work.

The following documents should be kept when claiming contractual services:

- Invoices for all services billed including detailed data submitted in support of the charges.
- Evidence of all payments to the contractor, including vouchers, paid checks or warrants and receipts for cash payments.
- The audit file when the cost of the construction will be a reimbursable type contract. This file should include the scope of the audit and the extent of the verification of the work performed.
- The contract shall not provide for reimbursement on the basis of a cost plus a percentage of the contract cost.

For sponsor's force account, only direct costs which are identified with the project are eligible for Federal participation. The same information that is collected for force account construction costs (labor costs, fringe benefits, equipment usage charges, material costs), would also be collected as they pertain to architectural, engineering, and consultant costs.

## Acquisition Of Land, Structures & Right-Of-Way

When airport sponsors acquire land, the sponsor should keep all papers relating to the acquisition of each specific parcel of land. Where practical, all documents and correspondence that relates to a specific parcel of land should be kept in a file folder for that particular parcel. This will give the airport sponsor a chronological order of all events and costs, from the beginning of the land acquisition to the completion.

Generally, the amount of funds claimed as a project cost will be the actual purchase price paid for the land, reduced by any credits. All records of any credits should also be kept. Incidental land costs such as penalty costs, prepaid real property taxes, appraisal fees, or any litigation expenses, should also be identified and included with each parcel of land.

For more information on recordkeeping concerning land acquisition please refer to **Chapter 4 - Airport Real Estate**.

## Administrative Costs

No administrative costs associated with a project will be allowed unless they are supported by evidence that these costs were necessary to the completion of the project. All invoices, claims, canceled checks or warrants, receipts, and any other evidences of payment pertaining to direct costs must be kept.

Administrative direct costs can include some of the following:

- Advertising Costs: Includes costs of advertising for bids for materials, supplies, construction work, etc.
- Project Formulation Costs: Includes costs associated with preparing, filing, and documenting the project application.
- Attorney Fees: Includes attorney fees, other than the attorney fees associated with land acquisition. These costs include legal services related to the formulation of the project, preparation of the contract and agreements, legal opinions, and any legal advice associated with the project.
- Abstract of Title Costs: Includes title examination and any corrective measures involved in the formulation of the project. It also includes fees incurred for the title examination and related work, if the project description does not include land acquisition.
- Materials and Supplies: It includes office supplies and any other materials used in the administration of the project.
- Clerical and Accounting Costs: Includes the time devoted to the project by the sponsor's regular employees. Records of the actual payroll time devoted to the project, and the type of work must be maintained.
- Telephone, Postage, and Travel Costs: Includes long distance telephone calls, postage, and travel expenses that are properly documented and supported by showing that these costs pertain specifically to the project.

## Refunding Debt And Issuing Bonds

Since airports and landing fields are works of public improvement, Section 14 of Article XIV of the Constitution of Louisiana states that municipal corporations or parishes of the state may incur and refund debt and issue negotiable bonds for acquiring, building, equipping or maintaining those airports and landing fields. No bonds shall be issued until they have been authorized by vote of a majority of the property taxpayers of that parish.



The municipalities and parishes may call a special election and submit to the taxpayers the question of whether to incur debt and issuing negotiable bonds. The election shall be ordered by a resolution which states the purposes for which the debt is to be incurred, the amount of the debt, the number of years for which the bonds are to run, and the maximum rate of interest.

## The Project Application Process

### *Step 1 - Contact The LA DOTD Aviation Section*

Obtaining federal funds for your project involves a very formal process. It is critical that you establish early contact with the LA DOTD Aviation Section and the FAA so they can assist you in getting project funding. The LA DOTD Aviation Section can be reached at:

**Louisiana Department of Transportation and Development  
Aviation- Section 88  
P. O. Box 94245  
Baton Rouge, Louisiana 70804-9245  
(225) 274-4125**

### *Step 2 - Determining What Planning Elements are in Place*

Prior to any consideration of a state or federally funded airport project, the local airport sponsor should have some basic planning elements already in place.

The following components should be considered as minimum requirements for all sponsors:

- **Airport Layout Plan (ALP):** All federally funded airport development projects must be accompanied by a FAA-approved ALP. The ALP includes a brief narrative report, an Airport Layout Drawing, and other safety and land-use related drawings. All plans are to be kept current and updated with any physical or activity changes at an airport. For more detailed information on the contents of the ALPs, please refer to **Chapter 6 - Airport Layout Plans**.
- **Capital Improvement Program (CIP):** The CIP is a listing of planned projects over a period of the next five (5) years. This will include cost estimations, expected funding sources, and a priority listing of the proposed projects. The CIP is usually incorporated into the Airport Master Plan or the Airport Layout Plan study. A standard FAA CIP format can be found on the enclosed CD or on the FAA website. The CIP should be accompanied by an Overall Development Objective (ODO) which relates projects and project elements to each other.
- **Airport Master Plan (AMP):** The FAA recommends, but does not require an AMP. The AMP is a more detailed report on the airport, its adjacent areas, growth environment and the airport development program. An AMP is typically prepared for airports with growing aviation activities.

- **Airport Action Plan (AAP):** The AAP is similar to the AMP except that it is concerned primarily with current airport assets and short term needs (5 to 6 years). It may be used instead of an AMP to help justify CIP needs.

A current and approved ALP (or AMP) and CIP are required prior to development of an airport project. The local airport sponsor should check with the LA DOTD Aviation Section to determine if these basic planning elements exist. If none exist, initiation of basic airport planning would be the first step to take.

### ***Step 3 – Select an Engineering Consultant***

An engineering consultant is an invaluable tool in the airport project process. Refer to Chapter 1 in this manual, “The Consultant Selection Process”, for insight into this procedure.

### ***Step 4 – Required Information for Grant Application***

Information that should also be prepared to support the grant application is as follows:

#### **Prepare a Project Description, Justification and Cost Estimate**

The Project Description is a brief narrative explaining the need of the project, its objectives, the method used to accomplish it, the geographical location of the project and the expected benefits the project will bring. When projects are competing for scarce Federal funds the project justification becomes extremely important, because the project justification can and will often times be used as the deciding factor. The cost estimate must be prepared in detail for the FAA’s review to determine if the costs are reasonable. The Capital Improvement Program in your Airport Master Plan or Airport Layout Plan can be one source of cost information.

#### **Prepare a Project Sketch**

The project sketch should be at least 8” x 11” and show the scope of the proposed project. This should be prepared as an attachment to the grant application.

### ***Step 5 - If Needed, Prepare an Environmental Assessment and/Or an Environmental Impact Statement***

The first step is to determine if your project warrants an environmental assessment or an environmental impact statement. The purpose of an environmental assessment and an environmental impact statement is to determine if the proposed project has any potential adverse environmental impacts and to identify and satisfy Federal, state, and local laws and regulations. For more information on the preparation of environmental assessments and environmental impact statements please refer to the FAA Order 5050.4A, “Airport Environmental Handbook”.

Airport layout plan approval or Federal financial participation in the following categories of actions normally would require an environmental assessment and, if needed, an environmental impact statement:

- Airport location.
- New runway.
- Major runway extension.
- Runway strengthening that would result in a 1.5 Ldn or greater increase in noise over any noise sensitive area located within the 65 Ldn contour.
- Construction or relocation of entrance or service road connections to public roads that will adversely affect the capacity of those public roads.
- Land acquisition associated with any of the above items plus land acquisition which results in the relocation of residential units when there is evidence of insufficient comparable replacement housing, major disruption of business activities, or acquisition which involves land covered under section 4 (f) of the Department Of Transportation Act.
- Establishing or relocating an instrument landing system, or an approach lighting system.
- An airport development action that the FAA would consider as having extraordinary circumstances as defined in the FAA Order 5050.4A, "Airport Environmental Handbook".

An environmental impact statement is normally required when the following actions occur:

- First time airport layout plan approval or airport location approval for a commercial service airport located in a standard metropolitan statistical area.
- Federal financial participation in or airport layout plan approval of a new runway that is capable of handling air carrier aircraft at a commercial service airport in a standard metropolitan statistical area.

Even though the above actions normally require an environmental impact statement, the preparation of the environmental impact statement will usually be preceded by an environmental assessment. If the environmental assessment shows that there are no significant impacts, then the action shall be processed as a "finding of no significant impact" thus eliminating the need for an environmental impact statement.

If an environmental assessment or environmental impact statement are required, then the project cannot be approved unless an *opportunity* for a public hearing has been offered. An *opportunity* can be accomplished by publishing a notice for public hearing in the newspaper in or near the proposed airport development. This notice must include a statement of the proposed development and also include that the purpose for the hearing is to consider the economic, environmental, and social effects of the proposed project and a statement saying persons interested in the hearing must submit requests for the hearing within 30 days.

If there is an adequate interest in a public hearing, then the airport sponsor must also publish in the same newspaper, a notice specifying the date, time, and location where the hearing will be

held, at least 15 days before the hearing date. Following the hearing, the airport sponsor must provide the FAA with a summary of the topics, alternatives, and conclusions that were discussed in the hearing.

If after enough opportunities for a public hearing have been established, no requests for a public hearing were received, then a public hearing need not be held. The airport sponsor must then submit a written statement saying adequate opportunities for a public hearing had been provided and that no request for a public hearing were received.

### ***Step 6 – Submit Project Application to State and FAA***

Submit the project application to the LA DOTD Aviation Section on the form **Application for State Financial Assistance**, which is located on the **enclosed CD**. The aforementioned application should also include the justification, cost estimate, project sketch, and requesting resolutions from the sponsor. All project applications to the state should be submitted no later than close of business on October 31 to be considered for funding that fiscal year.

### ***Step 7 - Project Approval/Disapproval and Allocation***

The airport sponsor should receive confirmation of approval/disapproval from the FAA by notice. If approved, the notice should identify the specific project work items and the amount of funds that will be reserved for those items. This notice is known as a Notification of Allocation. This allows the local airport sponsor to complete project plans and specifications and obtain contractor services. The Notification is conditional on the local airport sponsor to establish and adhere to a schedule that is acceptable to the FAA for submission of the Grant Application.

### ***Step 8 - Execute Sponsor/State Agreement***

The local airport sponsor **must** execute an agreement with the State in order to obtain State funding for the project. This Sponsor/State agreement is a formal contract made between the airport sponsor and the state of Louisiana stating that the LA DOTD Aviation Section will provide a percentage of the total project cost and may act as the airport sponsor's agent in the Grant Application process. A **sample Sponsor-State Agreement** can be located **on the enclosed CD**. The Sponsor-State Agreement package should also contain a set of LA DOTD Aviation Section Sponsor Certification documents. These should be filled out as the pertinent work is done and be returned to the LA DOTD Aviation Section upon completion.

***Step 9 - Establish Schedule for Submitting the Grant Application*** Upon receiving a Notification of Allocation, the local airport sponsor should immediately meet with the LA DOTD Aviation Section and the FAA to establish a schedule of actions which must be met prior to the FAA issuing a grant offer for the project. The FAA will provide the local airport sponsor with an estimated date for issuing the grant offer.

The schedule should indicate major events for completion before the grant offer is issued. The schedule should, depending on the project, provide firm dates for the following major events:

- Completion of sponsors funding
- Coordination with planning agencies

- Submission of the ALP
- Consultant selection
- Pre-design conference
- Submission of preliminary plans
- Request for state air and water quality compliance assurances
- Submission of final plans and specifications and engineer's report
- Completion of necessary land acquisition and relocation of displaced persons
- Adoption of zoning ordinances or other compatible land use measures
- Submission of title evidence
- Receipt of current wage rates and prepare/update DBE Goal information
- Advertising for bids
- Bid opening
- Award of contract
- Submission of FAA Grant Application
- Issuance of grant offer
- Pre-construction conference
- Acceptance of grant offer

The FAA Order 5100.38a "Airport Improvement Handbook" states that every effort should be made to schedule projects for grant agreement in the same fiscal year as the year the Notification of Allocation was made.

Modifications or changes to projects which have already received notices of allocation should not be used as a substitute for careful planning and estimating. Deletions or reductions of items should be undertaken with caution because it can affect the operating capability of the airport. If a modification or change is needed then the airport sponsor should request that change as soon as possible. If funds are to be increased, the airport sponsor must include a revised project estimate, project sketch, and the same type of information and documentation required for the Grant Application. If funds are to be decreased, the airport sponsor only needs to submit a revised project estimate.

## The Grant Application Process

### ***Step 10 - Does The Project Involve Construction?***

If the answer to this question is "No", then **proceed to Step 13.**

**Otherwise proceed to Step 11.**

### ***Step 11 - Direct Consultant to Prepare Plans and Specifications***

The local airport sponsor should direct its consultant to prepare the final project plans and specifications. This will be needed as a supporting document for a construction Grant Application. The consultant should submit the completed plans and specifications to the LA DOTD Aviation Section electronically and to the FAA on behalf of the local airport sponsor. These plans will require approval from the FAA.

### ***Step 12 - Direct Consultant to Advertise and Receive Bids***

As stated in **Step 10**, the FAA must approve the project plans and specifications prior to advertising. Analyzing the received bids involves comparing the consultant's cost estimates to the bids received. Significant differences between these two numbers should be thoroughly analyzed.

### ***Step 13 - Recommend Contractor for Award***

The local airport sponsor then should submit the Consultant's listing of the bids, an explanation of the bid price analysis, and the Consultant's recommendation for award to the FAA and to the LA DOTD Aviation Section. Federal and state funds cannot be used if the award is made to other than the lowest bidder. If the lowest bidder has not been recommended, then an explanation detailing the basis for finding the lowest bidder to be non-responsive or not responsible must also be submitted.

### ***Step 14 - Prepare And Submit the Grant Application***

The local airport sponsor, or the sponsor's consultant acting on behalf of the sponsor, will prepare and submit one (1) signed and dated original Grant Application with supporting documentation to the FAA.

A project description of the proposed work items should be included and should also be consistent with the information on the Notification of Allocation. Supporting material and documentation to be submitted with the application are as follows:

Final Plans and Specifications: These plans and specifications should be in the final form unless a later submittal is approved by the FAA.

Construction Safety Plan: A safety plan that covers all aspects of safety during the construction.

Estimate of Costs: This can include a list of bids if bidding has taken place or it can be the engineer's estimate.

Land Inventory Map: The land inventory map should be prepared by the airport sponsor in accordance with Appendix 7 of the FAA Order 5190.6.

Agreements: Any agreements between two or more cosponsors, an agent, or state sponsorship.

Air & Water Quality Certification: In projects involving a new airport location, a major runway extension, or new runway, a certification from a responsible state official assuring that the proposed project complies with air and water quality standards should be submitted.

Property Map (Exhibit A): The property map (Exhibit A) should:

1. Depict the existing runway layout, future runways, and existing and future clear zones;
  2. Identify all land that is to be developed or used as a part or in connection with the airport. Fee title or lesser interest in land, to be acquired by the airport sponsor, should also be identified by parcel or tract according to the existing or prior ownership. All avigation, drainage, and utility easements, permits, etc., should also be described in legend fashion;
  3. Show property interests by color, shade, or crosshatching, that will be used as part of the project and which Federal aid has been requested. Also show the property which is for current aeronautical use, noise abatement, future land to be acquired, buildings, facilities, and other improvements including the improvements on land which will be involved under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970;
  4. Show the location of relevant easements and include a brief descriptive note;
  5. Show any approved land release or consent to use for non-airport purposes.
- Other: Any other supporting data that may be required.

The FAA will then reviews and evaluate the Grant Application. If the FAA approves the application, the FAA will then issue a formal Grant Offer to the local airport sponsor.

### ***Step 15 - Executing the LA DOTD Aviation Section Sponsor/State Agreement***

A Sponsor-State Agreement is a formal document prepared by the LA DOTD Aviation Section and is sent to the airport sponsor for execution. A **sample Sponsor-State Agreement** can be located **on the enclosed CD**. The agreement states that the LA DOTD Aviation Section intends to pay a matching percentage of the allowable costs of an Airport Improvement Project for which a project Application has been submitted and approved.

The signature of the airport sponsor accepting the Sponsor-State Agreement is considered a binding contract between the LA DOTD Aviation Section and the airport sponsor. Therefore, the agreement is required to be executed by the public official who is authorized to accept the agreement. After the airport sponsor has signed the agreement, the executed agreement will then be returned to the LA DOTD Aviation Section.

The LA DOTD Aviation Section does allow the Sponsor-State Agreement to be changed after it has been executed if there are any changes in the project description or funding amounts. However, all such changes must be justified and approved by the LA DOTD Aviation Section and a Supplemental Agreement or Supplemental Funding Letter must be executed. Changes in the project description shall be done via the Supplemental Agreement on a case by case basis as determined by the LA DOTD Aviation Section. Changes in funding shall be done via the Supplemental Funding Letter and may not be approved until the end of the project. If sufficient funding becomes available, then State's match requirement may be met. However, if sufficient funds are not available, then the airport sponsor will be responsible for meeting their match requirement. Any plan change or changes to bid items must be submitted to LA DOTD Aviation Section to determine funding eligibility.

If the airport sponsor fails to comply with the conditions of the Sponsor-State Agreement, the LA DOTD Aviation Section can suspend or terminate the agreement by submitting a written notice to the airport sponsor.

### ***Step 16 - Preconstruction Conference***

The airport sponsor should hold a preconstruction conference to let all persons involved in the project become familiar with the various requirements of the project.

The persons who should participate in the preconstruction conference will vary but may include the following:

- Airport Sponsor's Engineer and Testing Personnel or Other Representative
- Airport Manager
- State Agency Representative
- Airport's FAA Field Office Representatives
- Representatives of Military Organizations (if necessary )
- Local Managers for Airlines
- Air Transportation Representatives
- Contractor and Subcontractors

The FAA Advisory Circular AC 150/5300-9 provides more information on items to be considered in developing an agenda for the preconstruction conference.

### ***Step 17 - Issue Notice-To-Proceed***

When the FAA and the LA DOTD Aviation Section are satisfied that all pre-construction requirements have been met, that the plans and specifications correspond to the general scope and design concepts of the project, that the project costs are considered reasonable, and that all appropriate engineering/construction standards will be complied with, then they will authorize the local airport sponsor to proceed with construction and to issue a notice-to-proceed. Upon issuance of the notice-to-proceed, the project will begin.

### ***Step 18 - Receipt of Project Payment***

The project funds will be *reimbursed* at an amount not to exceed the estimated amount of work that has been performed by the consultant/contractor, invoiced to the sponsor, and paid for by the sponsor. The reimbursement will be sent to the LA DOTD Aviation Section on the **LA DOTD Aviation Request for Reimbursement** form, which is located on the **enclosed CD**. The reimbursement request should also include copies of all invoices associated with the request, and copies of the paid check.

### ***Step 19 - Grant Closeout Procedures***

The project closeout is when the LA DOTD Aviation Section and the airport sponsor complete the final administrative actions for all requirements of the Sponsor-State Agreement. The closeout process usually requires examining three areas to make sure that all steps have been taken and that all conditions have been met: project work completion; administrative requirements; and financial requirements.



### **Project Work Completion Requirements**

Conditions to be met before project work completion can vary according to the following types of work:

Planning: The conditions are met when the airport sponsor has completed the work elements described in the program narrative of the Sponsor/State Agreement.

Land Acquisition: Conditions are met when the airport sponsor obtains satisfactory property interest in all parcels included in the application description and has submitted all evidence and certifications for all the parcels.

Equipment Acquisition: Conditions are met when the equipment is delivered, installed, and tested in accordance with the approved plans and specifications.

Construction: Conditions are met when all work items in the Sponsor/State Agreement have been completed in accordance with the approved plans and specifications and the final inspection has been completed.

Combination of the Above: Conditions are met when each specific portion of the combination meets the closeout requirements.

### **Administrative Requirements**

To close out the project with the LA DOTD Aviation Section, the local airport sponsor must send the following information:

1. Copy of Sponsor's Letter of Acceptance
2. Final Reimbursement Request
3. Approved ALP (if applicable)
4. Clear Lien Certificate, and
5. Final Plans & Specifications (As-Builts submitted electronically)
6. Sponsor Certifications (**on enclosed CD**)

## **Conclusion**

All airport projects have aspects and characteristics that make each project different from the other. The airport sponsor should always seek assistance from the LA DOTD Aviation Section and the FAA with any question they might have concerning this rather complicated process.

## References

Federal Aviation Administration Order 5050.4A, “Airport Environmental Handbook”

Federal Aviation Administration Order 5100.38A, “Airport Improvement Program (AIP) Handbook”

Louisiana Department of Transportation and Development, Aviation Section, “Consultant Selection Manual for Louisiana Airport Projects”

# Chapter 4 - Airport Real Estate

## Introduction

In an attempt to increase an airport's capacity and enable an airport to grow, land use planning and land acquisition has become an important consideration in an airport's operation within a community. Failure to control the uses of land on and around an airport can reduce an airport's ability to expand. Also, with the ever increasing issue of airport noise, land acquisition is often the only means an airport can use to control the surrounding land. This chapter will discuss general issues surrounding the controls available to an airport sponsor to assist them in controlling the use of land on the airport, as well as land immediately surrounding the airport.

## Leases

Contracts, or binding agreements, that give individuals or entities the right to use real estate, equipment, or facilities for a specified period of time and for a specified rent are better known as leases. The types of leases at general aviation airports are all different and are usually tailored to the needs of the specific airport. As per the Louisiana Revised Statutes, Title 2, all proposed leases must be reviewed and approved by the LA DOTD Aviation Section prior to their execution.

## Lease Agreements

The Louisiana Revised Statutes 2:135.1, states that airport districts, airport authorities, and other political subdivisions, including the New Orleans Aviation Board, which establish or operate airports or landing fields or which acquire or set apart immovable property for such purpose may: Lease to any person, as defined in this Title, areas for operations space, improvements, including industrial development, and equipment on such airports or landing fields; provided that all leases of land, improvements, or equipment, except as hereinafter provided, shall be by public bid under the provisions of the Public Bid Law, R.S. 38:2181 et seq., or under the provisions on leases of public lands, R.S. 41:1211 et seq.. This advertisement must be in the official journal at least once a week for three consecutive weeks. However, this requirement only applies to airports not eligible to receive federal funding. Title 2 also states, "Notwithstanding any provision of law to the contrary and specifically any provision contained in Paragraph (3) of this Subsection, the governing authority of any airport located in this state which is eligible to receive funding from the Federal Aviation Administration is authorized to lease to any person, as defined in this Title, land, areas for operations space, improvements, including industrial development, and equipment on airports or landing fields provided that any such governing authorities leasing land, improvements, or equipment, except as hereinafter provided, shall charge fair and reasonable prices for airport properties as determined by appraisals and fair market value comparisons in accordance with Federal Aviation Administration guidelines. The appraisals and fair market value comparisons required by this Paragraph shall be conducted and paid for by the governing

authority of the airport.” If an airport sponsor chooses to, or is required to advertise, then the advertisement for the land to be leased shall include the following information:

- Description of the property to be Leased
- Time when bids are to be received
- Short summary of the Lease terms
- Lease conditions
- Purposes of the Lease

The public bids will be secret, sealed bids, and shall be publicly opened by the **lessor** [person(s) awarding the Lease], and be awarded to the highest bid submitted that will give the greatest benefits to the public in services and financial return. The lessor has the right to reject all bids. All Leases are to be signed by the lessor and copies shall be furnished as follows:

- One copy shall be given to the **lessee** (person entering into the Lease);
- One copy shall be recorded in the **Conveyance Records** of each parish in which the land is located;
- One copy shall be sent to the **Louisiana Department of Transportation and Development, Aviation Section**; and
- One copy shall be kept in the **lessor’s records**.

All of the above Leases shall be for a period of time that is consistent with Louisiana R.S. 2:135.1.

If during the primary term of the Lease the lessee constructs, at its expense, permanent improvements on the land over certain dollar amounts, then the lessor may extend the lease. The amounts and extension periods shall also be consistent with Louisiana R.S. 2:135.1.

When private property bordering an airport is acquired by a public body, as described in the Louisiana Revised Statutes Section 133, Leases may be entered into between the owner of the airport and the owner of this property without advertising or competitive bidding. The terms of the Lease agreements shall be determined by the **appraised value** of the land and /or buildings And shall be for a period of time of no more than 10 years.

Where the lessor has constructed or contemplates the construction of a building or other improvements in order to expand the services of the airport, the lessor may execute a lease for a period not to exceed twenty-five years and provide for a monthly or annual rental, payable monthly or annually in advance, and advertise in accordance with Subsection A, such lease may provide for the option to renew on stipulated conditions, without further advertising or competitive bidding, for periods not to exceed an additional twenty-five years.

The lessor should include a reversion clause in the lease that requires any property built and/or any improvements to said leased property will become the property of the airport owner at the expiration of the term of the lease.

No municipality, parish, airport district, airport authority, or other political subdivision may grant a Lease of an entire airport. The public may not be deprived of its rightful, equal, uniform use of the airport or landing field unless it is determined to be in the interest of public safety.

## Lease Terms And Standards

The airport sponsor should include all items concerning the lessee's rights and the lessee's obligations upon entering into the lease. All conditions and standards concerning leasehold upkeep, utility payments, service charges, etc., whether the responsibility of the airport or of the lessee, should be clearly defined. All of the lease terms should be stated as simply as possible so everyone fully understands the lease conditions. City or parish attorneys should assist the airport sponsor with this process in assuring every condition, obligation, and right is listed in the lease as clearly as possible.

- Standards are policies developed by the owner requiring minimum performance from anyone who places improvements on or conducts activity on the airport.

An **example of a typical airport lease and operating agreement** can be located **on the enclosed CD. Chapter 2 - Airport Rules and Regulations**, includes more information on minimum standards for airports and writing and distributing these standards.

## Land Acquisition

Airports often find it necessary to acquire land for airport operations, both for current and future airport purposes. The term airport purposes would include building areas, landing areas, runway protection zones, approach areas, areas for noise compatibility, and offsite areas required for airport utilities, such as sewerage, drainage, power, and obstruction lighting. According to the Federal Aviation Administration Order 5100.38C "Airport Improvement Program Handbook", future airport development is considered to be the development of a facility more than 5 years after acquiring the land. An airport sponsor may use the land acquisition in planning a new airport or in the development of an existing airport.

Land acquisition that is to be used for current airport development would be eligible for federal grants if the land being acquired is to be used for the following:

- Landing Areas (runways, taxiways, and associated safety areas, ramps, aprons, etc.).
- Airport Approach Areas (runway protection zones, approach and transitional zones, and horizontal zones).
- Building Area (airport terminal, administration buildings, hangars, equipment buildings, etc.).
- Navigational Aid Facilities (installation, operation, and maintenance of NAVAIDS).
- Airport Utilities (drainage, sewage, storm water runoff, utility lines, etc., that are located outside the airport boundaries).
- Airspace Conflicts.

Land acquisition that is to be used for future airport development must meet certain requirements in order to be eligible for federal grants. Requirements for land acquisition pertaining to eligibility for federal grants are as follows:

- There must be a valid aeronautical need for the land;
- The site selected has been approved by the FAA;
- Airspace clearance for the site has been granted; and
- There is an approved airport layout plan.

Acquiring land that is to be used only for purposes of land use and noise compatibility is eligible for federal grants when the land is to be used as follows:

- An element of an FAA approved noise compatibility program;
- Reimbursement for noise land acquired through the fiscal year 1986 or as a part of a noise compatibility project included in a multi-year grant entered into prior to 1987;
- A requirement for a mitigation measure in relation to an airport development project.

In addition to the above requirements, all real property land acquisition that is to be eligible for federal grants must be accompanied by a real estate appraisal. For further guidance, refer to FAA Order 5100.38C, Chapter 7 and Advisory Circular (AC) 150/5100-10A.

## Release of Airport Property

In dealing with the release or transference of airport property, there may be different requirements depending on the property type. The primary concern is how the release of the property is affected by the airport sponsor's obligations. Airport owners that plan to sell a portion of airport property should first contact their FAA Program Manager. The program manager will most likely involve the FAA compliance specialist to determine the extent of Federal Obligations associated with the tract of land in question.

The different types of land may include surplus property that has been transferred to the airport owner from the federal government. Release of surplus property has different requirements and must be handled differently than release of property that is not surplus property.

For guidance in dealing with the release of airport property, you should reference FAA Order 5190.6A – Airport Compliance Handbook. For guidance in dealing with surplus property, you should also reference Advisory Circular (AC) 150/5150-2B.

## References

Federal Aviation Administration Order 5100.38C, "Airport Improvement Program (AIP) Handbook"

Federal Aviation Administration Advisory Circular AC 150/5100-10A, "Accounting Records Guide for Airport Aid Program Sponsors"

Louisiana Law Revised Statutes Title 2, "Aeronautics"

Federal Aviation Administration Order 5190.6A, "Airport Compliance Requirements"

Federal Aviation Administration Advisory Circular AC 150/5150-2B, "Federal Surplus Personal Property for Public Airport Purposes"

# Chapter 5 - Airport Layout Plans

## Introduction

- a. This chapter provides guidance in the preparation of the drawings that make up the Airport Layout Plan (ALP) drawing set. The intent of this chapter is to discuss the procedures that should be considered in preparing the plans. The ALP depicts existing airport facilities and proposed developments as determined from the review of the existing aviation activity, forecasts, facility requirements, and land uses. Engineers and planners should identify environmental issues early in any project scoping process to ensure an environmental strategy to these issues is addressed in the ALP. See 5.9 for environmental notes.
- b. FAA Order 5100.38, *Airport Improvement Program Handbook*, Chapter 4, *Planning Projects*, Section 3, *Planning Project Accomplishment*, paragraph 428, *FAA Approval Actions*, provides supplemental guidance for the preparation of an ALP. Unites States Code (USC) 47107(a) (16) requires a current ALP with both sponsor and FAA approval to ensure the safety, utility and efficiency of the airport. Per Order 5100.38, an ALP remains current for a five-year period, or longer, unless major changes at the airport are made or planned.
- c. The ALP preparer must work closely with the airport sponsor, FAA Southwest Regional Airports Office, and the LA DOTD Aviation Section to define the requirements, standards, and criteria to be employed. To ensure that the ALP is comprehensive, all parties must agree to its content and standards.
- d. The ALP graphically depicts current and future airport facilities. The remaining drawings included in the ALP drawing set are considered appended to the ALP and are a part of it.
- e. The five primary functions of the ALP plans that define its purpose are:
  - 1) An approved plan is necessary for the airport to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP), as amended, and to be able to receive specific Passenger Facility Charge funding. An airport must keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned Federal programs, the same guidance is to be applied to all Louisiana public use airports.
  - 2) An ALP creates a blueprint for airport development by depicting proposed facility improvements. The ALP provides a guideline by which the airport sponsor can ensure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.



- 3) The ALP is a public document that serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
  - 4) The approved ALP enables the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and procedural needs. The approved ALP will also allow the FAA to protect the airspace required for facility or approach procedure improvements.
  - 5) The ALP can be a working tool for the airport sponsor, including its development and maintenance staff.
- f. The ALP drawing set is a set of planning drawings and is not intended to provide design engineering accuracy. Individual items such as runway coordinates, obstruction survey data, and application of airport design standards must comply with FAA No. 405, Standards for Aeronautical Surveys and Related Products. The ALP preparer will need to define accuracy requirements for specific elements of the ALP in cooperation with the airport sponsor and Louisiana DOTD Aviation.
- g. Airport Layout Plans are prepared either as first time ALPs, formal revisions based on major changes to the airport, or informal revisions based on minor improvements to the airport. Informal revisions, often referred to as pen-and-ink revisions, can be made to individual sheets of the ALP drawing set, although the responsibility for review and approval must still be coordinated with the FAA. These and other requirements are discussed in FAA Order 5100.38, *Airport Improvement Program Handbook*.

## Airport Layout Plan Drawing Set

- a. The individual sheets that comprise the Airport Plans drawing set will vary with each planning effort. The ALP preparer, sponsor, FAA and the LA DOTD Aviation Section must determine which sheets are necessary during the project scoping activities.
- b. Drawings that might be included in the Airport Plans drawing set are described below. Drawing Plan Sheets that are required as minimum ALP components are identified as required (See 5.2a, 5.2b, 5.2c):
  - 1) **Cover Sheet** – A separate cover sheet, with approval signature blocks, airport location maps, and other pertinent information as required by the local FAA airports office.
  - 2) **Airport Layout Plan** – (Required) A drawing depicting the existing and future airport facilities. The drawing should include required facility identifications, description labels, imaginary protection areas, Runway Protection Zones, Runway Safety Areas and basic airport and runway data tables. Figure 5-1 is an example of an ALP.
  - 3) **Airport Data Sheet** – A separate sheet containing basic airport and runway data tables.

- 4) **Facilities Layout Plan** – This drawing is essentially a simplified ALP. It depicts existing and future facilities, and only critical, non-overlapping clearance criteria, with minimal text.
- 5) **Terminal Area Plan(s)** – This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area, but might also include general aviation facilities and/or cargo facilities.

## Airport Layout Plan Drawing – (Figure 5.2)

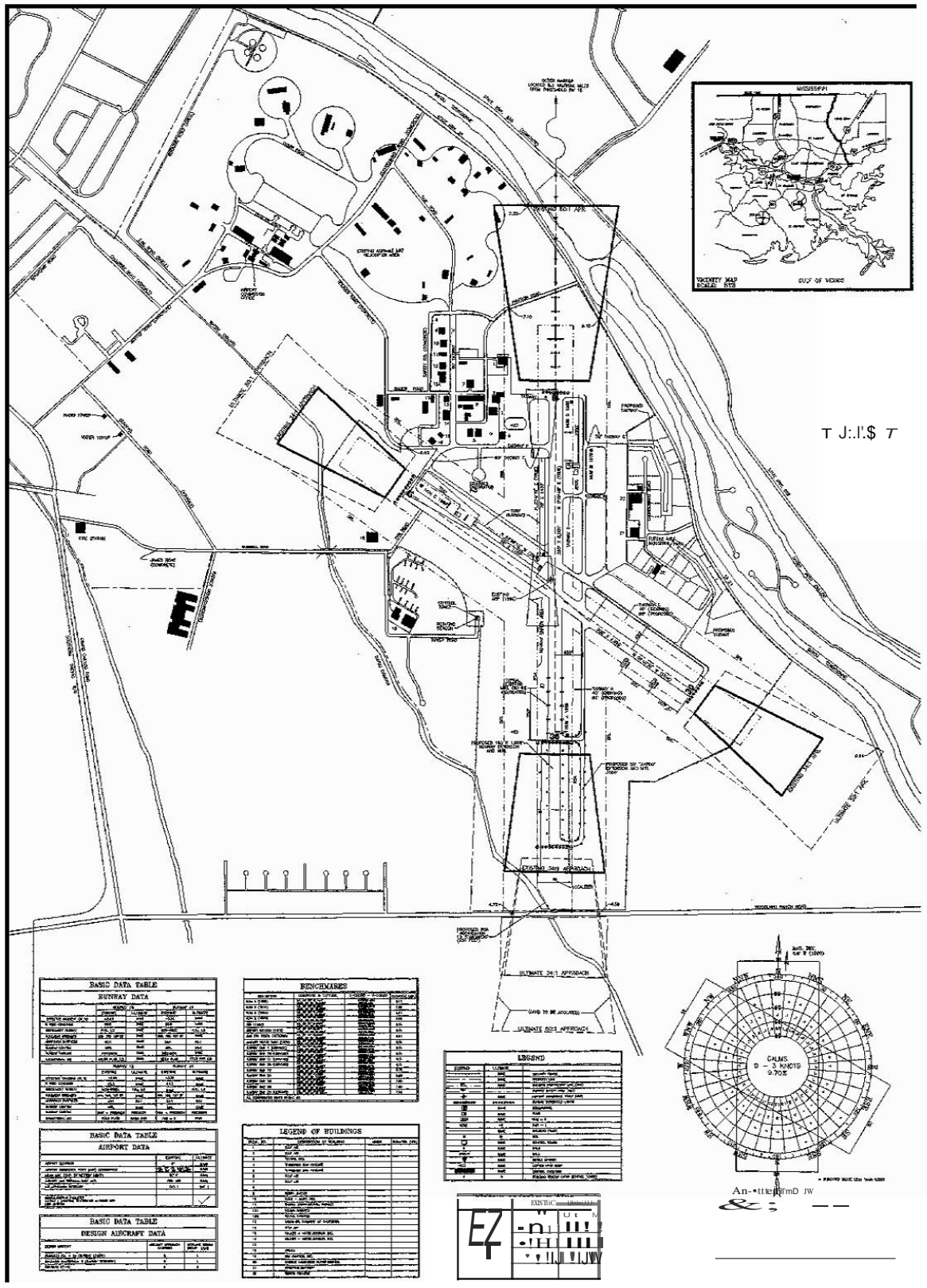
A complete ALP consists of several components. (The ALP must, as a minimum, also have the elements noted below as required).

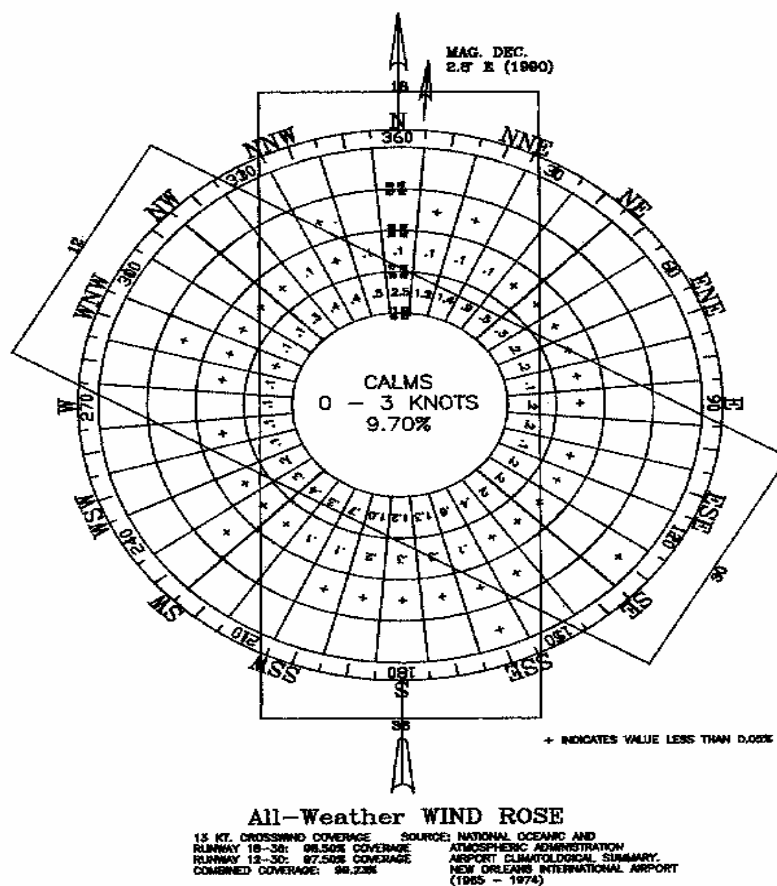
- a. Sheet size – 24" x 36"
- b. Scale – Within a range of 1" = 200' to 1" = 600'
- c. North Arrow
  - 1) True and Magnetic North
  - 2) Year of the magnetic declination
  - 3) Orient drawing so that north is to the top or left of the sheet
- d. Wind Rose – (Figure 5.2)
  - 1) Data source and the time period covered
  - 2) Include individual and combined coverage for:
    - a) Runways with 10.5 knots crosswind
    - b) Runways with 13 knots crosswind
    - c) Runways with 16 knots crosswind
    - d) Runways with 20 knots crosswind
- e. Airport Reference Point (ARP) – Existing and ultimate with latitude and longitude to the nearest second based on NAD 83
- f. Ground contours at intervals of 2' to 10' lightly drawn
- g. Elevations (Existing and Ultimate to 1/10 of a foot)
  - 1) Runway

- 2) Displaced thresholds
  - 3) Touchdown zones
  - 4) Intersections
  - 5) Runway high and low points
  - 6) Roadways where they intersect the RPZ edges and extended runway centerlines
  - 7) Structures on Airport. If a terminal area plan is not included, show structure top elevations on this sheet.
- h. Building limit lines – Show on both sides of the runways and extend to the airport property line or RPZ.
- i. Runway Details (Existing and Ultimate)
- 1) Dimensions – length and width within the outline of the runway
  - 2) Orientation – Runway end numbers and true bearing to the nearest 0.01 degree
  - 3) Markings
  - 4) Lighting – Threshold lights only
  - 5) Runway Safety Areas. Dimensions may be included in the Runway Data Table
  - 6) End Coordinates – Note near end (existing and ultimate) of each runway end to nearest 0.01 second
  - 7) Displaced threshold coordinates to the nearest 0.01 second
  - 8) Declared Distances – For each runway direction if applicable. Identify any clearway/stopway portions in the declared distances
- j. Taxiway details (Existing and Ultimate)
- 1) Taxiway widths and separations from the runway centerlines, parallel taxiway, aircraft parking, and objects
- k. RPZ Details (Existing and Ultimate)
- 1) Dimensions
  - 2) Type of property acquisition (fee or easement)
  - 3) Approach slope ratio (20:1; 34:1; 50:1)

- l. Airport Data Table (Existing and Ultimate) – (Table 5.1)
  - 1) Airport elevation (MSL)
  - 2) Airport Reference Point (ARP) Data
  - 3) Mean maximum temperature
  - 4) Airport Reference Code (ARC) for each runway
  - 5) Design Aircraft for each runway or airfield component
- m. Runway data Table (Existing and Ultimate) – (Table 5.2)
  - 1) % effective gradient
  - 2) % wind coverage
  - 3) Maximum elevation above MSL
  - 4) Runway length and width
  - 5) Runway surface type
  - 6) Runway strength
  - 7) Part 77 approach category
  - 8) Approach type
  - 9) Approach Slope
  - 10) Runway lighting (HIRL, MIRL, LIRL)
  - 11) Runway marking
  - 12) NAVAIDs and visual aids
  - 13) RSA dimensions
- n. Title and Revision Blocks
  - 1) Name and location of the airport
  - 2) Name of preparer
  - 3) Date of drawing
  - 4) Drawing title

- 5) Revision block
- 6) FAA disclaimer
- 7) Approval block
- o. Other
  - 1) Standard Legend
  - 2) Existing and Ultimate airport facility and building list
  - 3) Location Map
  - 4) Vicinity Map





RUNWAY 18		RUNWAY 36		
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
EFFECTIVE GRADIENT (IN %)	+0.04	SAME	-0.04	SAME
% WIND COVERAGE	96.0	SAME	96.0	SAME
INSTRUMENT RUNWAY	FULL ILS	SAME	NON-PRECISION	FULL ILS
PAVEMENT STRENGTH	50 S, 75 D, 137 DT	SAME	50 S, 75 D, 137 DT	SAME
APPROACH SURFACES	50:1	SAME	34:1	50:1
RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	PRECISION	SAME	PRECISION	SAME
NAVIGATIONAL AIDS	MALSR, PAPI, ILS	SAME	REILS, PAPI	REILS, PAPI, ILS
RUNWAY 12		RUNWAY 30		
	EXISTING	ULTIMATE	EXISTING	ULTIMATE
EFFECTIVE GRADIENT (IN %)	+0.06	SAME	-0.06	SAME
% WIND COVERAGE	93.3	SAME	93.3	SAME
INSTRUMENT RUNWAY	NON-PRECISION	FULL ILS	SAME	FULL ILS
PAVEMENT STRENGTH	50 S, 75 D, 137 DT	SAME	50 S, 75 D, 137 DT	SAME
APPROACH SURFACES	34:1	50:1	34:1	50:1
RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
RUNWAY MARKING	NON-PRECISION	PRECISION	NON-PRECISION	PRECISION
NAVIGATIONAL AIDS	REILS, PLASI	REILS, PAPI	VASI-II	PAPI

**Table 5.2: Basic Runway Data Table**

## Airport Airspace Drawing – (Required - Figure 5-4)

A drawing depicting obstacle identification surfaces for the full extent of all airport development, per 14 CFR Part 77, Objects Affecting Navigable Airspace. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.

- Plan view of all Part 77 surfaces based on ultimate runway lengths
- Small scale profile views of existing and ultimate approaches



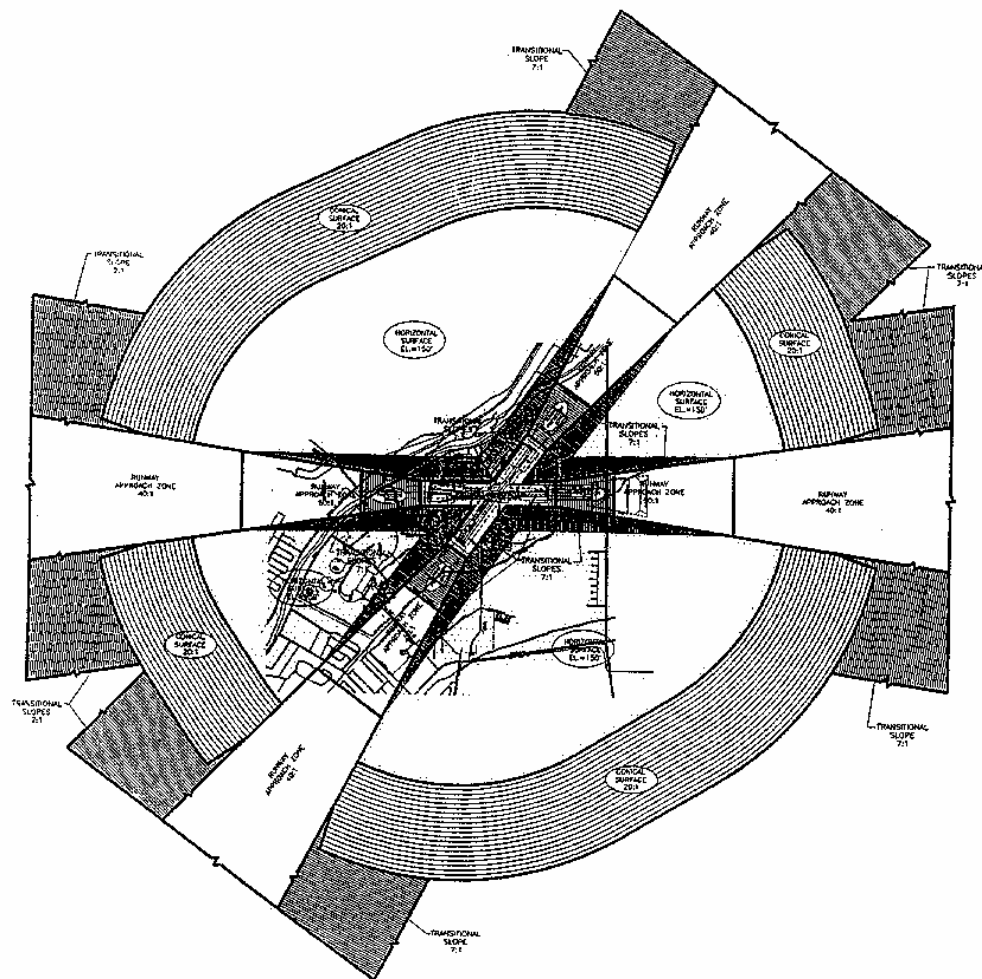
- c. Obstruction data tables, as appropriate
- d. Sheet size – same as the airport layout drawing
- e. Scale – 1" = 2,000' for the plan view; 1" = 1,000' for approach profiles; and 1" = 100' (vertical) for approach profiles
- f. Title and revision blocks - same as the airport layout drawing
- g. Approach Plan View Details –
  - 1) USGS for base map
  - 2) Show runway end numbers
  - 3) Include 50' elevation contours on all slopes
  - 4) Show the most demanding surfaces with solid lines and others with dashed lines
  - 5) Identify top elevations of objects that penetrate any of the surfaces. For objects in the inner approach, add note "See inner portion of the approach plan view for close in obstructions."
  - 6) For precision instrument runways show balance of 40,000' approach on separate sheet.
- h. Approach Profile Details
  - 1) Depict the ground profile along the extended runway centerline
  - 2) Identify all significant objects (roads, rivers, etc.) and top elevations within the approach surfaces regardless of whether they are obstructions

## **Inner Portion of the Approach Surface Drawing – (Required Figure 5-4)**

Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface violations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawing may also depict other approach surfaces, including the threshold-siting surface, those surfaces associated with United States Standards for Instrument Procedures (TERPS), (See Advisory Circular 150/5300-13 Appendix 16 Change 6 (or latest edition)). The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.

- a. Large scale plan views of inner portions of approaches for each runway, usually limited to the RPZ areas

- b. Large scale projected profile views of inner portions of approaches for each runway, usually limited to the RPZ areas
- c. Interim stage RPZs when plans for interim runways extensions are firm and construction thereof is reasonably assured in the near future
- d. Sheet size – Same as Airport Layout drawing
- e. Scale – Horizontal 1" = 200'; vertical 1" = 20'
- f. Title and revision blocks – Same as for Airport Layout drawing
- g. Plan View Details
  - 1) Aerial photos for base maps
  - 2) Numbering system to identify obstructions
  - 3) Depict property line
  - 4) Identify by numbers all traverse ways with elevations and computed vertical clearance in the approach
  - 5) Depict the existing and ultimate physical end of the runways. Note runway end number and elevation
  - 6) Show ground contours lightly drawn
- h. Profile View Details
  - 1) Depict terrain and significant items (fences, roadways, etc.)
  - 2) Identify obstructions with numbers on the plan view
  - 3) Show roads and railroads with dashed lines at edge of the approach
- i. Obstruction Table Details
  - 3) Prepare a separate table for each RPZ
  - 4) Include obstruction identification number and description, the amount of the approach surface penetration and the proposed disposition of the obstructions
  - 5) Show existing and ultimate runway ends and FAR Part 77 approach slopes.



**Figure 5.4: Airport Airspace And Runway Protection Zone Drawing**

## Airport Property Map

A drawing depicting the airport property boundary, the various tracts of land that were acquired to develop the airport, and the method of acquisition. If any obligations were incurred as a result of obtaining property, or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary.

- a. Sheet size – Same as Airport Layout drawing
- b. Scale – Same as the Airport Layout drawing
- c. Title and revision blocks – Same as for Airport Layout drawing
- d. Legend
- e. Data Table

- 1) Use a numbering or lettering system should be used to identify tracts of land
  - 2) The date the property was acquired
  - 3) The Federal aid project number under which it was acquired
  - 4) Type of ownership (fee, easement, federal surplus, etc.)
- b. Show existing and future airport features (i.e., runways, RPZs, NAVAIDs, etc.) that would indicate aeronautical need for airport property.

## Airport Utility Drawing

This drawing depicts the location and capacity of major overhead utilities and or underground on the airport and in the surrounding area. The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the major overhead or underground utilities may not be needed.

- a. Large scale plan view of the area or depicting utility feeder routes, etc. are located
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Utility Data Table – For listing overhead structures and showing pertinent information relative to them. Include space and columns for:
  - 1) Use numbering system to identify structures
  - 2) Include top elevation of overhead structures
  - 3) Identify existing and planned obstruction marking

## Airport Terminal Area Plan Drawing

This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. The need for this drawing will be decided on a case-by-case basis. For small airports, where the Airport Layout drawing is prepared to a fairly large scale, a separate drawing for the terminal area may not be needed.

- a. Large scale plan view of the area or areas where aprons, buildings, hangars, parking lots, etc. are located
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'

- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Building Data Table – For listing structures and showing pertinent information relative to them. Include space and columns for:
  - 1) Use numbering system to identify structures
  - 2) Include top elevation of structures
  - 3) Identify existing and planned obstruction marking

## **Airport Access Plan Drawing**

If access to the airport is a significant issue, a separate airport access drawing should be created, depicting the major routes of various modes of transportation that serve the airport. Such a drawing could also include proposed improvements to the system.

- a. Large scale plan view of the area access depicting the major operational access routes and proposed construction access
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Range of 1" = 50' to 1" = 100'
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Access Route Data Table – For listing access route names and showing pertinent information relative to them. Include space and columns for:
  - 1) Show assigned identity of the access route(s)
  - 2) Include type of construction (Asphalt, Concrete, etc.)
  - 3) Identify existing weight bearing limits or proposed increases

## **Off-Airport Land Use Plan Drawing**

A drawing depicting land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the 65 DNL noise contour. For general aviation airports or low activity commercial service airports, where noise issues are less important, on-airport land use and off-airport land use may be combined.

- a. Include all land uses (industrial, residential, etc.) off the airport to at least the 65 DNL contour
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Same as the Airport Layout drawing

- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Aerial base map
- f. Legend (symbols and land use descriptions)
- g. Identify public facilities (e.g., schools, parks, etc.)
- h. Drawing details – Normally limited to existing and future airport features (i.e., runways, taxiways, aprons, RPZs, terminal buildings and NAVAIDS)

## **On-Airport Land Use Plan Drawing**

A drawing depicting the land uses within the airport property boundary.

- a. Include all land uses (industrial, etc.) on the airport to at least the 65 DNL contour
- b. Sheet size – Same as Airport Layout drawing
- c. Scale – Same as the Airport Layout drawing
- d. Title and revision blocks – Same as for Airport Layout drawing
- e. Aerial base map
- f. Legend (symbols and land use descriptions)
- g. Identify public facilities (e.g., schools, parks, etc.)
- h. Drawing details – Normally limited to existing and future airport features (i.e., runways, taxiways, aprons, RPZs, terminal buildings and NAVAIDS)

## **Agricultural Aviation Operations Area**

Airports that have agricultural aviation operations should designate an area that will be used only for such operations on their ALP. An agricultural operations area should be defined as the area on an airport that is used for loading agricultural airplanes. Depending on the volume of agricultural operations and whether it is economically feasible, it may be necessary to add an additional designated operational area. One area can be designated for the handling of liquid chemicals and the other area can be designated for the handling of dry non-toxic materials.

The designated agricultural operations area should be considered a special purpose area and should be designed to operate separately from the general aviation areas of the airport. This will allow the area to be restricted to agricultural aircraft and their support equipment only and will yield the highest level of safety and efficiency. In addition, the area should also restrict access from any public roads and any unauthorized personnel from the agricultural operations area.

**a. Chemical Handling Area**

The chemical handling area should be located within the designated agricultural area. This area will be used for all aspects of handling liquid chemicals used for agricultural operations. Some of the aspects of handling liquid chemicals will include:

- Chemical handling
- Chemical mixing
- Loading or discharging chemicals onto or from the agricultural aircraft
- Washing the aircraft's internal spray system

Due to the fact that asphalt pavements tend to absorb spilled liquids and the effects of some of the liquid herbicides on asphalt pavements are unknown, it is recommended that the chemical handling area be designated only on Portland Cement Concrete aprons. This area should be underlaid with a material that will not allow any seepage through to the underlying soil. This portion of the apron should be located away from drainage courses that might collect any chemical spills and thus contaminate the storm water drainage system. This apron area should also be sloped to a collection drain that will collect any spills and also collect any wash water. The liquids collected should be disposed of according to all Louisiana DEQ regulations and by a licensed non-hazardous waste disposal company and should be prohibited from entering the storm drainage system.

**b. Dry Material Loading Area**

Generally, when aircraft agricultural operations use dry non-toxic materials, an area needs to be designated to allow enough space for the loading and unloading of this material. This area needs to allow room for the transport trucks delivering the material, the aircraft, and the hopper trucks that transfer the material from the transport trucks into the aircraft. Since these areas can be quite large, it may not be economically feasible to establish an area specifically for material handling. In some cases, these areas can be placed adjacent to the chemical handling areas, at closed runways or taxiways, or if large enough, on the general aviation apron. In each case, these areas should be restricted and kept separate from general aviation activities.

**c. Herbicide Material Storage**

When dealing with herbicides and other chemicals, it is of primary concern that these materials are kept in a clean, secured, locked area. Improper storage, use and disposal of these materials can result in environmental contamination. The best way to prevent pollutant problems is at the source. Prevent or reduce the discharge of these pollutants by storing materials in a designated area, by installing secondary containment, by conducting regular inspections, and by training all employees on the proper uses of these materials.

As stated, a chemical handling area should be designated on the ALP for material delivery and storage. The airport's tenants must keep accurate, up-to-date inventory of the materials delivered and stored on-site. This will help in determining what type of response is needed in the event of a spill. Tenants should keep their inventory low by storing only the amount of materials that they need for a specific task. Whenever possible, store materials in a covered and/or enclosed area with a secondary containment such as an earthen dike, metal pan, or other containment

device. These materials should not be stored directly on the ground. Drums or bagged materials should be placed on pallets and covered to prevent exposure to rainwater.

The designated storage area should be kept clean and well organized. The designated storage area should be routinely checked for external corrosion of material containers. An ample supply of spill cleanup materials should also be kept near the storage area.

## **CAD Design Standards**

- a. ALP drawings are produced electronically using computer-aided design (CAD) software. The sponsor and the LA DOTD Aviation Section will select what program, to use. Either may also have CAD standards that they want to be used in the drawings. The CAD standards may include, for example, defined line types, line weight/thickness, lettering styles, symbols, and file-naming conventions. The sponsor, FAA and/or LA DOTD Aviation Section must determine which standards must be followed in development of the Airport Plans drawing set.
- b. Following CAD standards will facilitate the review and approval of the drawings by the FAA, mitigate the chance of misunderstanding the drawings, produce drawings that are useful for the LA DOTD Aviation Section statewide planning efforts and the airport sponsor, and produce drawings that may be used in subsequent planning and design efforts.

## **Geographic Information Systems**

- a. Geographic Information Systems (GIS) is computer-based software that links geographic location, or mapping, to various databases, may be used by the airport sponsor for a number of purposes, including: the inventory and maintenance of airport facilities, preparation for emergency services, planning for airport improvements, the inventory of airport property, and the inventory of sensitive environmental areas
- b. The ALP may be linked to an existing GIS or the airport sponsor may implement a new GIS incorporating the ALP. The ALP preparer should understand the intended use of the GIS and the associated ALP standards and requirements. The ALP standards may include specific CAD standards for GIS compatibility and ALP requirements may include specific facility and data needed for GIS applications. For example, a GIS database including the airfield lighting and signage will define a portion of the inventory and mapping effort. Similarly, a GIS used for emergency services or analysis of airport access may require mapping of the local road network.

## **Base Mapping and Data Sources**

Base mapping and data source issues should be discussed as part of the plan scoping, since they may affect not only the plans, but also subsequent environmental matters. These issues might include the following:



- a. **Base Mapping** – The level of detail required for the base mapping for the ALP must be determined by the sponsor, FAA and LA DOTD Aviation Section, and the ALP preparer. Although some sponsors may already have the necessary data, often new base mapping will be required. Base mapping is typically done at the outset of the planning effort and is used in the facility requirement determination and preferred alternatives analysis and selection. Since these processes ultimately establish the total area that will be depicted on the drawings, the preparer should establish the area that must be mapped by considering the following:

- f* Potential airport expansion beyond the existing boundaries
- f* The extent of noise contours
- f* Location of other potential environmental impact areas
- f* The area required to address ground access issues
- f* The area to be depicted on the Approach Surface Drawing
- f* Implications of the use of GIS

The ALP preparer will need to determine what intervals of topographical contours to use on the maps. Topographic issues may be important in the alternatives analysis and require reduced contour intervals.

The ALP prepared should also consider how to analyze airspace obstructions and violations. If aerial photogrammetry is used for the obstruction analysis, mapping can be paired with it, but parameters for both products must be established.

- b. **Airspace Obstruction Identification and Analysis** – An assessment of airspace obstructions near the airport should be included on the Approach Surface Drawings and the Airspace Drawing. The ALP preparer and reviewing agency must establish data sources and parameters for this assessment. Obstruction data sources include existing sources such as airport obstruction removal programs, previous obstruction survey data, the National Oceanic Atmospheric and Atmospheric Administration (NOAA) obstruction chart, and the FAA Digital Obstacle File. Numerous methods may be used for the inventory of new obstructions or for verification of identified obstructions, including a physical site survey using traditional methods, the use of aerial photogrammetry, and laser mapping. Obstruction analysis parameters include the extent of the approach surface that will be surveyed and analyzed and the survey of areas off the sides of the runways. Existing obstruction clearing and maintenance programs at the airport may minimize the need for extensive obstruction surveying. Conversely, development of a new airport, construction of new runways, extension, reclassification, or approach procedure revisions to existing runways may require additional surveying.
- c. **Off-Airport Property** – The airport property map will identify the parcels that were acquired to develop the airport. The airport alternatives analysis may benefit from an inventory of parcels surrounding the airport boundary, particularly in areas of anticipated

airport development. Being able to identify these parcels by size and use may also benefit potential subsequent environmental studies. The ALP preparer, LA DOTD Aviation Section, and airport sponsor should determine if expanding the property map to include these areas is necessary.

## Checklists

- a. The primary guideline for development of the ALP and drawing set is the FAA checklist incorporated herein this chapter in sections 5.2a thru 5.2i.
- b. Other checklists from the FAA Southwest Region and/or the LA DOTD Aviation Section may supplement the chapter checklist. The ALP preparer should identify applicable checklists at the outset of the project.
- c. For airports not included in the National Plan of Integrated Airports System (NPIAS), the chapter checklist applies.
- d. Planners must verify that the drawing checklists are current, since they are continually revised to reflect changing FAA and the LA DOTD Aviation Section standards.
- e. Once the applicable drawing checklists have been identified, the ALP preparer should consult with the Sponsor, FAA and LA DOTD Aviation Section to define the specific items on the checklists that are applicable to the project. The checklist herein is comprehensive and not all items are applicable to a specific project.

## Approvals

- a. The ALP drawing set approval process will vary, depending on the requirements of the FAA Southwest Region Airports Office and those of the LA DOTD Aviation Section. The sponsor, FAA, state and ALP preparer need to identify which approval process will be used at the outset of ALP preparation.
- b. Per FAA Order 5100.38, *Airport Improvement Program Handbook*, FAA review and coordination of the ALP will cover Federal interests and must consider any required coordination that was not completed at the local or state level.
- c. The review of the Airport Plans drawing set will typically be completed through multiple submittals. Milestones must be determined by the approving agency, but typically include:
  - 1) **Preliminary ALP submittal** – The drawing set should be submitted to the sponsor for review and comment to ensure that the graphic depictions correctly present the sponsor's goals.
  - 2) **Draft ALP Submittal** – The drawing set and support documentation should be submitted to the FAA and LA DOTD Aviation Section for review and comment.

Review comments must be addressed prior to submittal of the Draft ALP drawing set for airspace review.

- 3) ***Draft ALP Airspace submittal*** – The Draft ALP drawing set should be submitted to the FAA Southwest Region Airports Office for distribution to various other FAA offices for airspace review. As noted above, in some cases the FAA may require that the Draft ALP drawing set be submitted for review and comment and then resubmitted for airspace review after their comments have been addressed. In other cases, the FAA may conduct the airspace review at the same time as their general review of the Draft ALP drawing set.
- 4) ***Final ALP submittal*** – ALP drawing set should be revised, as needed, based on the airspace determination and review comments if these were not addressed prior to submitting the Draft ALP drawing set for airspace review. The final ALP drawing set and accompanying narrative (Master Plan Report, Action Plan Report or ALP Narrative Report) should be sent to the reviewing agency for distribution.
- d. **Conditional Approval** – The FAA will occasionally approve the Airport Plans drawing set conditionally, based on specific components that will be subject to further review and approvals prior to funding and implementation.
- e. **Unconditional Approval** – The FAA may unconditionally approve the Airport Plans drawing set when all proposed development projects are either categorically excluded from additional environmental processing, have received a Finding of No Significant Impact from an Environmental Assessment, or have received a Record of Decision from an Environmental Impact Statement.

## Documentation Guidelines

- a. The requirements for documentation for the Airport Layout drawing set must be determined with the airport sponsor and the FAA Southwest Region Airports Office and/or Louisiana DOTD Aviation. Documentation will typically include a complete reduced-size (11 x 17) set of the Airport Plans drawing set and the accompanying text. The master plan will provide the narrative if the ALP is prepared as part of a master plan. If the ALP is prepared separately, an ALP narrative is required. The narrative will typically describe ALP development criteria, independent of other chapters of the master plan, and the rationale for the development shown on the ALP. Examples of these include airport reference code-related design criteria unique to specific areas of the airfield, or known or proposed modifications to FAA design standards.
- b. The quantity and form of ALP drawing sets must also be defined with the airport sponsor, FAA Southwest Region Airports Office and the LA DOTD Aviation Section. A reproducible mylar, full size signed original copy and multiple paper copies of the plans set may be required. Distribution requirements should be established during the project scoping.

- c. Electronic files of the Airport Plans drawing set must be prepared. These files are typically provided to the LA DOTD Aviation Section and may also be provided to the sponsor.

## Environmental Strategy

- a. Environmental strategy does not need to follow the specific impact categories outlined in the current version of FAA Order 5050.4 *Airport Environmental Handbook*. Rather, FAA Order 5050.4 should be consulted to help airport managers, engineers, and planners develop the background material for the environmental strategy for a specific airport.
- b. Engineers and planners should identify environmental issues early in the project scoping process to ensure that the budget addresses these issues.
- c. All airport development should consider appropriate Federal, State, and local environmental laws and regulations. There are approximately 40 Federal laws, executive orders, and regulations protecting particular parts of the environment, such as the Clean Air, Clean Water, Endangered Species, and National Preservation Acts, and an Executive Order on Protection of Wetlands. Louisiana DEQ may have additional environmental requirements that should also be addressed in the early stages of project development.
- d. During the project scoping process, airport managers, engineers and planners should identify short-term capital development projects that are known to trigger additional environmental processing, such as a runway extension. For such projects, the airport sponsor should consider whether the environmental processing could start before the project design process is started. The guidance can be extended to longer-term projects in the case of new airports or major reconfigurations of existing airports.
- e. Airport managers should recognize the need to achieve a balance between the manmade and the natural environment. Although every proposed development project will have some impact to the natural environment, the use of prudent planning criteria, along with sound environmental data and analysis, will help minimize environmental impacts and the delay of project design and construction.

## Elements of An Environmental Strategy

- a. **Introduction** – The purpose of an environmental strategy is to help the sponsor evaluate alternatives and to determine the environmental analyses required for each of the projects identified in a typical five year capital improvement plan. The airport manager should also understand that the environmental evaluation must be tailored to each airport's size, unique setting, and operating environment. An environmental strategy should identify the environmental processing required by the National Environmental Policy Act (NEPA) and what permits will be required.

The environmental strategy should combine the environmental inventory with the planned capital improvement projects. Capital improvement projects might include items

such as future runway extensions and aircraft apron expansions. Airport studies might include items such as an update of the airport's Storm Water Pollution Prevention Plan or the development of a storm water master plan.

- b. **Project Timing and Phasing** – Airport Managers should review the airport existing demand/capacity and facility requirements and alternatives chapters of his airport master plan or action plan to help make a list of short- intermediate-long-term projects. The timing of the proposed projects may help to identify cumulative impacts that could be associated with them. The cumulative impact is the incremental environmental impact of an action, when added to past, present, and reasonably foreseeable future actions. For example, an apron expansion may not have a significant environmental impact by itself, but if the airport sponsor also built a taxiway extension and an approach lighting system at the same time, the total or cumulative impacts may trigger additional environmental analysis. Furthermore, if a project, such as a runway extension is dependent on another component, such as an associated approach lighting system they must be evaluated together.
- c. **Key Environmental Issues Identification** – Engineers and planners should identify the key environmental issues of each development project as part of the environmental strategy plan. Categories of potential impacts are defined in the current versions of FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, *Airport Environmental Handbook*. For example, if a sponsor determined that a runway extension would affect four impact categories, the environmental strategy plan would evaluate the potential impact of those four categories. This evaluation may require additional alternatives to be developed and reviewed. These specific categories and applicable environmental laws, regulations, policies, and associated permits should be clearly identified in the environmental strategy as a plan to address the specific issues.
- d. **Identification of Environmental Processing Required** – The FAA has established criteria for determining the level of environmental processing required for each project. Regulations for implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500-1508), issued by the President's Council On the Environmental Quality (CEQ) are outlined in the current versions of FAA Order 1050.1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4, *Airport Environmental Handbook*. These orders provide guidance on the level of environmental processing required for airport development projects. All Federal actions regarding airport development projects fall into three categories:
  - f Those normally requiring an environmental impact statement (CEQ 1508.11)
  - f Those requiring an environmental assessment (CEQ 1508.9)
  - f Those projects that are normally categorically excluded (CEQ 1508.4)

The sponsor engineer and planner should consult FAA Order 5040.4 for guidance on FAA criteria for determining which category of environmental processing is appropriate for each project. In some cases, extraordinary circumstances may require an environmental assessment for a project that would normally be categorically excluded.

Funding applications require information about environmental issues for each project. A project may be eliminated from further consideration for FAA funding until the necessary environmental processing is completed.

- e. **Key Permit Identification** – Key permits needed for each project should be identified early in the project planning process and outlined in the environmental strategy for that project or series of linked projects. If key construction permits are not identified early in the project identification process, delay in the implementation of a project can result. Although such requirements can vary greatly within each locality, some of the permits that may be necessary include:
  - f Section 404 Dredge and Fill Permit
  - f Air Quality Permit for on-site batch plants or other construction-related activities
  - f Local government construction permits
  - f Growth Management Permits
  - f EPA, USFWS, and State Wildlife and Game Commission Permits, if protected and endangered species could be impacted.
  - f National Pollution Discharge Elimination System Permits
- f. **Environmental Streamlining** – Streamlining the environmental component of the project development process is a priority for the FAA. The intent of the streamlining process is to ensure the consideration of the human and natural environments in the decision making process, as outlined in an FAA report *The Report to Congress, Environmental Review of Airport Projects*, dated May 21, 2001. Under streamlining, the FAA has encouraged environmental resource agencies to work cooperatively to complete the environmental review of projects to avoid the construction delays, unnecessary duplication of effort, and added costs often associated with current practice of reviewing and approving airport projects. Early identification of required environmental processing and permits allows the collection and analysis of environmental data to proceed on a parallel track with airport planning. The environmental strategy should identify areas of overlapping analysis of sequenced projects. An airport sponsor environmental strategy can serve as a bridge between the project planning effort and NEPA process.

## Consideration of Environmental Factors in Airport Master Planning

The FAA white paper, “Consideration of Environmental Factors in Airport Master Planning,” dated July 2001, contains recommendations for how to evaluate environmental factors in airport planning. Included herein, it contains a discussion of the interaction of the airport planning and environmental processes and recommendations for how to effectively integrate these processes. The appropriate treatment of environmental factors in airport master planning can make subsequent detailed environmental processing more efficient and speed the completion of airport development. Although the white paper is primarily intended for large and complex projects, many of the techniques in the guide can be applied to all levels of environmental clearance.

## Applications to the Project Planning Process

The project justification and selection of alternatives, including documentation of why certain alternatives were not carried forward, should be completed before the NEPA process is started. Only those alternatives that have aeronautical utility should be forwarded for NEPA analysis.

The environmental strategy should be a concise summary of the environmental actions required to implement the desired capital improvement project such as:

- a. **FAA Approval** – The major product of the planning effort is an Airport Layout Plan (ALP), showing existing and proposed facilities, on which the FAA has approval authority.  
An airport sponsor seeking a grant for an airport improvement project or requesting unconditional approval of the ALP should reference the current version of FAA Order 5050.4 and FAA Order 1050.1 for guidance in determining environmental requirements.
  - 1) The incorporation of environmental evaluations in the preparation of the ALP will help refine project alternatives that will minimize the potential impact on the environment.
  - 2) The FAA may unconditionally approve an ALP when all proposed development projects have been categorically excluded from additional environmental processing, have received a Finding Of No Significant Impact (FONSI) from an Environmental Assessment, or have received a favorable Record of Decision (ROD) from an Environmental Impact Statement prepared for them. When an ALP contains projects that may require additional environmental processing, the FAA may approve the ALP conditionally. A conditionally approved ALP will detail the environmental processing required by the FAA. Implementation of the project(s) should not be undertaken until the environmental processing has been completed and the FAA has approved the ALP.
- b. **Environmental Considerations in the Airport Planning Alternative Analysis** – Environmental factors must be considered during the deliberation and analysis of alternatives to avoid the selection of an alternative that is later rejected because of its environmental impacts. Considering an alternative's environmental impacts early in the process reduces or eliminates the prospect of having to later update the Airport Layout Plan reflecting changes due to environmental considerations.
  - 1) Alternatives to a proposed capital project should provide sufficient detail regarding the justification for the project so that the alternative analysis for the project may serve as the basis for the purpose and need section of any environmental document.
  - 2) For most airports, only a few of the environmental impact categories will need to be discussed, (such as noise, wetlands, social impacts, etc.) based on location-specific areas of concern and whether an environmental overview has recently been conducted. Engineers and planners don't need to list each specific impact category, but only those that might require mitigation. In many cases, a simple environmental

overview will be sufficient to identify those issues. Detailed impact analyses will be produced in any Environmental Assessment or Environmental Impact Statement that follows for a specific project as needed.

## Environmental Strategy Documentation Guidelines

- a. The environmental strategy for an airport should have a brief action plan for each major short- medium- and long-term project listed in the five year capital improvement plan. The plan should concisely identify the type of environmental processing needed for each project, including the FAA determination as to whether the project will be required to undergo an environmental assessment or will be categorically excluded. In addition, the plan should identify necessary local, state and federal permits for each project.
- b. Engineers and planners should use appendices for the majority of the technical documentation, such as noise analysis, wetland mapping, and threatened and endangered species reports to improve the readability and organizational flow of the environmental strategy.
- c. The environmental impacts of the Airport Layout Plan should be addressed in a candid manner, so that the public, as well as the sponsor, easily understands them.

## Summary

An ALP is one of the most important tools an airport sponsor can use. If any assistance is needed regarding putting together ALPs, please feel free to contact your respective FAA and/or LA DOTD Aviation Section program manager at the following address:

### **LA DOTD**

**Aviation Section - 88**

**P. O. Box 94245**

**Rouge, LA 70804 - 9245**

**(225) 274-4125 Fax (225) 274-4181**

### **DOT/FAA**

**LA/NM ASW-640**

**2601 Meacham Boulevard Baton**

**Fort Worth, Texas 76137-4298**

**(817) 222-5640 Fax (817) 222-5988**

## References

Federal Aviation Administration Advisory Circular, 150/5070-6B, "Airport Master Plans"

Federal Aviation Administration Advisory Circular, 150/5190-4A, "A Model Zoning Ordinance to Limit Height of Objects Around Airports"



# Chapter 6 - Airport Maintenance

## General Aviation and Reliever Airport Maintenance Grant Program Fund

The GA and Reliever Airport Maintenance Fund is comprised of Transportation Trust Fund (specifically Aviation Trust Fund) monies appropriated by the legislature to assist in funding maintenance needs in an attempt to enhance safety issues at existing Louisiana airport facilities.

Aviation Trust Fund money may be used for this program provided state matching fund requirements for all Federal Aviation Administration grants for capital improvements, planning, and NAVAIDS have been satisfied. In no event shall the total sum of monies used from the Transportation Trust Fund for this purpose exceed two hundred thousand dollars (\$200,000) in any fiscal year.

Maintenance reimbursements for this program may be submitted two times a year, once in December and once in July. Initially, an airport may only be eligible to receive up to a maximum of \$3,225.00 for reimbursement in any fiscal year. This will be the maximum amount eligible if all 62 General Aviation airports participate in the program at full capacity. At the end of the State's fiscal year, the monies from those airports that did not participate may be redistributed to those airports who submitted reimbursements for more than the initial eligible amount. Reimbursements must be submitted on the official LA DOTD Aviation Section **General Aviation and Reliever Maintenance Grant Program Reimbursement Form** which is located on the enclosed CD.

**Table 6.1** shows a list of those items that are eligible for reimbursement under this program and those items that are not eligible for reimbursement. The LA DOTD Aviation Section will reimburse those eligible maintenance items at 50%.

## GENERAL AVIATION & RELIEVER AIRPORT MAINTENANCE GRANT PROGRAM

LA DOTD Aviation Section will reimburse all eligible items of maintenance work at 50%

### **ELIGIBLE ITEMS (EXAMPLES)**

<ul style="list-style-type: none"> <li>4 Discrepancies as noted on the current 5010 Inspection Report</li> <li>4 Pavement               <ul style="list-style-type: none"> <li>o Crack and Joint Repair</li> <li>o Pot Hole Repair</li> <li>o Spalling Repairs</li> <li>o Marking and Striping</li> </ul> </li> <li>4 Non-Pavement               <ul style="list-style-type: none"> <li>o Safety Areas</li> <li>o Grading</li> <li>o Drainage</li> <li>o Edge Dressing</li> <li>o Fill Material around Pavement Edges</li> <li>o Seeding</li> </ul> </li> <li>4 Purchase of Chemicals               <ul style="list-style-type: none"> <li>o Herbicides</li> <li>o Pesticides</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>4 Bermuda Release Program</li> <li>4 Airfield Lighting Repairs</li> <li>4 NAVAIDS</li> <li>4 Obstruction Removal               <ul style="list-style-type: none"> <li>o Runway Protection Zone</li> </ul> </li> <li>4 Maintenance Equipment Rental</li> <li>4 Repairs to Airport Owned/Dedicated Maintenance Equipment</li> <li>4 Grass Cutting               <ul style="list-style-type: none"> <li>o Contract Cutting</li> <li>o Fuel for Self Cutting</li> </ul> </li> </ul>
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### **INELIGIBLE ITEMS (EXAMPLES)**

<ul style="list-style-type: none"> <li>4 Engineering</li> <li>4 Insurance</li> <li>4 Salaries and Non-Contracted Labor</li> <li>4 Utilities</li> <li>4 Repairs to Terminal Building</li> <li>4 Repairs to Revenue Producing Facilities/Equipment</li> </ul>	<ul style="list-style-type: none"> <li>4 Landscaping</li> <li>4 Airport Access Road</li> <li>4 Auto Parking Areas</li> <li>4 Capital Improvement Projects</li> <li>4 Capital Equipment Purchases</li> <li>4 Any Appliance Repair</li> <li>4 Equipment Leases</li> </ul>
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**Table 6.1 Maintenance Eligible/Ineligible Items**

# Chapter 7 - Pavement Maintenance

## Introduction

An airport's pavement construction techniques are as critical as the design in providing a safe operational area for aircraft operations. Normal aircraft pavement distresses, weathering, poor drainage, and movement of the underlying layer begin immediately after construction. Because of the continued deterioration, a routine maintenance schedule and plan becomes critical.

**The Federal Aviation Administration Act of 1994, Section 107 (e) requires that an application for replacement or reconstruction of an airport pavement may be approved only if the sponsor has provided assurances or certifications that the airport has implemented an effective pavement maintenance and management program.**

A summary of the steps needed to institute a pavement maintenance program are outlined below:

- Evaluate the Pavement
- Prepare a Cost Analysis
- Commence Inspection Procedures
- Institute Preventive Maintenance Procedures
- Institute Restoration Maintenance Procedures

Normal disintegration, increased air traffic activities, and weathering conditions are some of the variables that affect pavement deterioration. Pavement deterioration begins immediately following construction, making it imperative to start a routine inspection schedule. Early detection and repair of pavement problems are the most important preventative maintenance steps that can be taken to prolong the life of pavements.

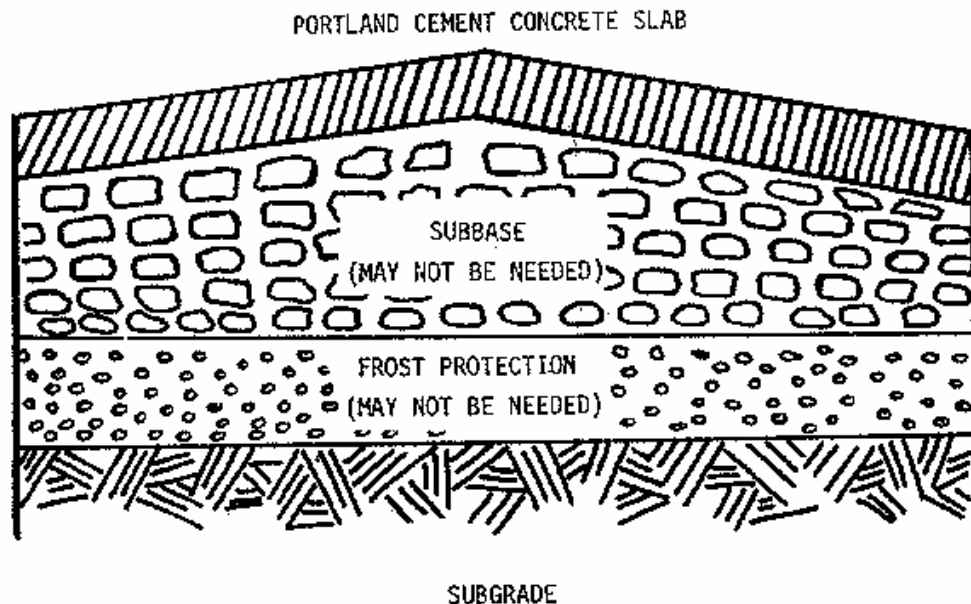
This chapter will provide information on pavement types, various types of problems and pavement deterioration, and recommended corrective maintenance actions as provided by the Federal Aviation Administration (FAA) in the Advisory Circular AC 150/5380-6A, "Guidelines and Procedures for Maintenance of Airport Pavements".

## Pavement Types

Airport pavements are designed, constructed, and maintained to support the critical loads imposed on the pavement and to produce a smooth and safe riding surface. The pavement must be of such quality and thickness that it will not fail under the loads of aircraft and be durable enough to withstand the abrasive action of traffic, adverse weather conditions, and other deteriorating influences. Pavements are divided into three classes: rigid pavements, flexible pavements, and overlays.

## Rigid Pavements

Rigid pavements are normally composed of portland cement concrete (PCC) as the prime structural element. Depending upon conditions, the pavement slab may be designed with plain, lightly reinforced, continuously reinforced, pre-stressed, or fibrous concrete. The concrete slab is usually placed on a compacted granular subbase which, in turn, is supported by a compacted sub-grade. A typical rigid pavement structure is shown in **Figure 7.1**. These pavements possess a high degree of rigidity. This rigidity enables rigid pavements to distribute loads over large areas of the sub-grade as shown in **Figure 7.2**. For better pavement performance, it is important that support for the entire concrete slab is uniform. Rigid pavement construction strength is most economically built into the slab itself with optimum use of low-cost materials under the slab.

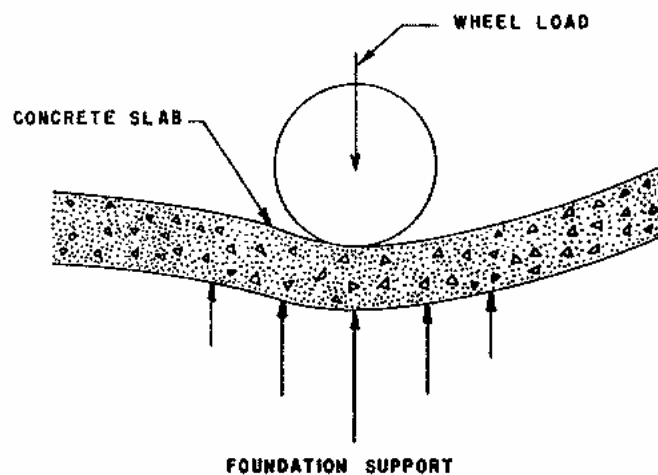


**Figure 7.1: Typical Rigid Pavement Structure**

Rigid pavement consists of the following layers:

- **Concrete Slab (Surface Layer)** - Provides a skid-resistant surface, prevents the infiltration of surface water, and provides structural support to the aircraft.
- **Subbase** - Provides uniform, stable support for the pavement slab. A minimum subbase thickness of 4 inches is generally required under rigid pavements. Other functions of the subbase are to control frost action, provide subsurface drainage, control swell of sub-grade soils, and prevent mud-pumping of fine grained soils.
- **Stabilized Subbase** - Required for all new rigid pavements designed to accommodate aircraft weighing 100,000 pounds or more.

- **Frost Protection Layer** - provides a barrier against frost action and frost penetration into the lower frost-susceptible layers.
- **Subgrade** - Compacted soil layer which forms the foundation for the pavement system. Subgrade soils are subjected to lower stresses than the surface and subbase courses. These stresses decrease with depth, and the controlling sub-grade stress is usually at the top of the sub-grade unless unusual conditions exist. Soil conditions are related to the ground water level, density, moisture content, and frost penetration. Since the sub-grade soil supports the pavement and the loads imposed on the pavement surface, it is critical to investigate soil conditions to determine their effect on grading and paving operations and the necessity for underdrains.



**Figure 7.2: Transfer Of Wheel Load To Foundation In Rigid Pavement Structure**

## Flexible Pavements

Flexible pavements support loads through bearing rather than flexural action. They are composed of several layers of carefully selected materials designed to gradually distribute loads from the pavement surface to the layers underneath. The design is such that the load transmitted to each successive layer does not exceed the layer's load bearing capacity. A typical flexible pavement section is shown in **Figure 7.3**. **Figure 7.4** depicts the distribution of the load imposed on the sub-grade. The various layers of flexible pavement and their functions they perform are as follows:

- **Bituminous Surface or Wearing Course** - Bituminous surface, or wearing course, comprised of a mixture of various selected aggregates bound together with asphalt cement, heavy grades of tars, or other bituminous binders. Its function is to prevent the penetration of water to the base course; provide a smooth surface, free from loose particles (which might endanger aircraft or persons); resist the stresses developed as a result of aircraft loads; and furnish a skid-resistant surface without causing undue wear on tires.

- **Base Course** - Principal structural component of the flexible pavement. It distributes the imposed wheel load to the pavement foundation, the subbase and/or the sub-grade. The base course must be of a quality and thickness to prevent failure in the sub-grade and/or the subbase, withstand the stresses produced in the base itself, resist vertical pressures that tend to produce consolidation and result in distortion of the surface course, and resist volume changes caused by fluctuations in its moisture content. The materials comprising the base course are select, hard and durable aggregates which generally fall into two main classes: stabilized and granular. The stabilized bases normally consist of crushed and uncrushed aggregate that has been bound with a stabilizer such as cement or bitumen.

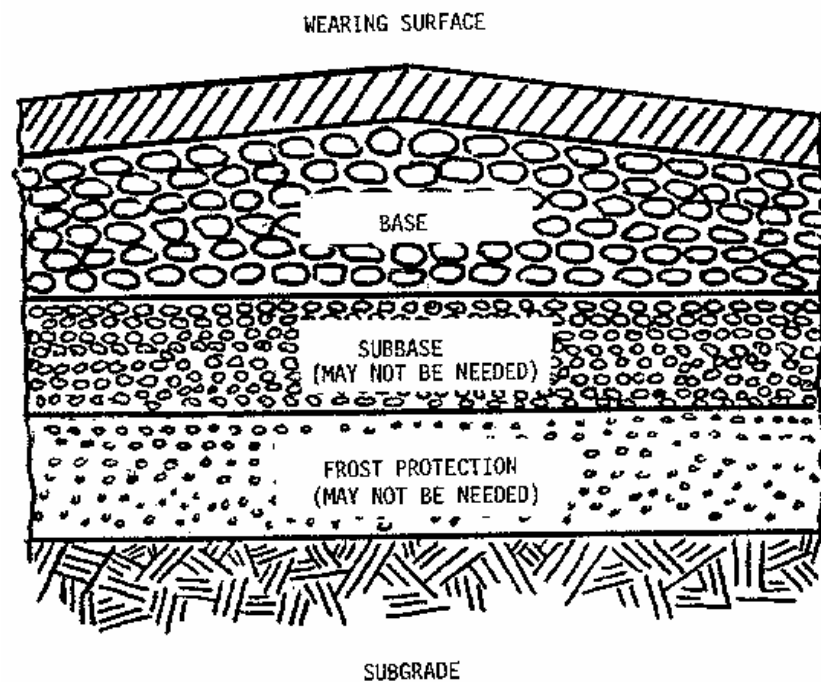
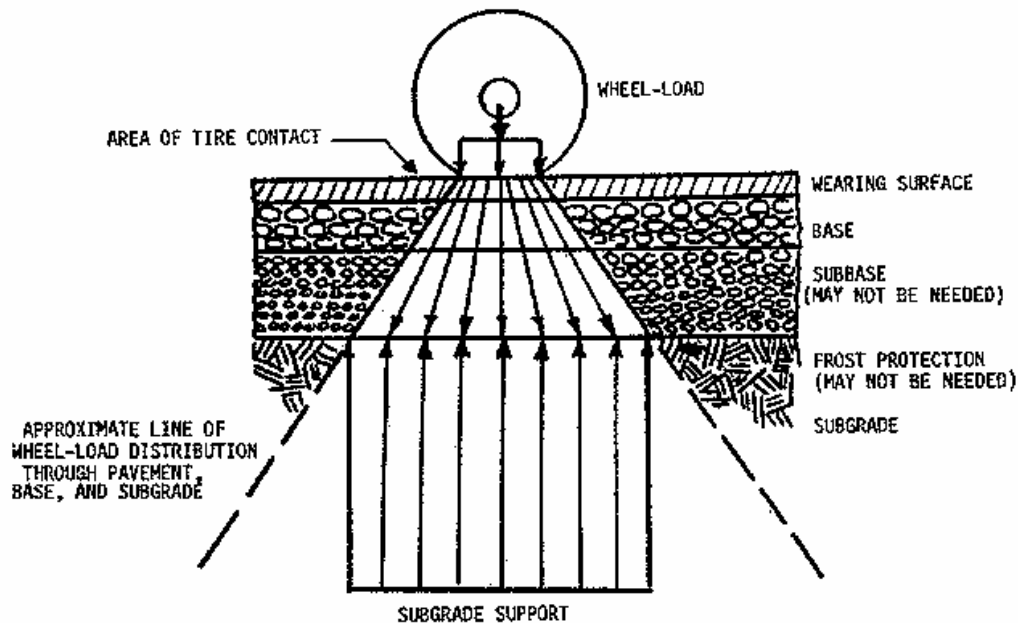


Figure 7.3: Typical Flexible Pavement Structure

- **Subbase** - Layer used in areas where frost action is severe or in locations where the subgrade soil is extremely weak. The function of the subbase course is similar to the base course. The material requirements for the subbase are subjected to lower load stresses. The subbase consists of stabilized or granulated materials properly compacted.
- **Frost Protection Layer** - The frost protection layer functions are previously discussed under the “Rigid Pavements” section.
- **Subgrade** - Compacted soil layer which forms the foundation for the pavement system. Subgrade soils are subjected to lower stresses than the surface, base, and subbase courses. Since load stresses decrease with depth, the controlling sub-grade stress is usually at the top of the sub-grade. The combined thickness of subbase, base, and wearing surface

must be great enough to reduce the stresses occurring in the sub-grade soil layer. Factors affecting sub-grade behavior are previously discussed under the “Rigid Pavements” section.



**Figure 7.4: Distribution Of Load Stress In Flexible Pavement Design**

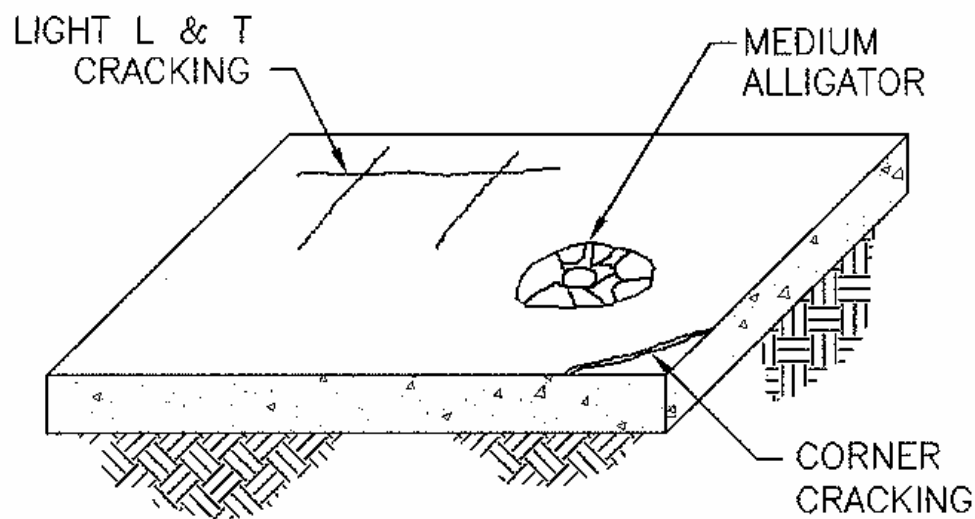
## Overlays

Pavement overlays are usually undertaken to correct deteriorating pavement surfaces, to improve ride quality or surface drainage, to maintain the structural integrity, or to increase pavement strength. For instance, a pavement may have been damaged by overloading; it may require strengthening to serve heavier aircraft; uneven settling may have caused severe puddling; or the original pavement simply may have served its useful life and is worn out. Generally, airport pavement overlays consist of either Portland Cement Concrete or bituminous concrete.

## Pavement Distress

Visible evidence of excessive stress levels in pavement systems includes cracks, holes, depressions, and other types of pavement distresses. Pavement distresses in airport pavements, such as cracks, affect the structural integrity, ride quality, and safety of airport pavements by allowing water and foreign particles to deteriorate the pavement at a faster rate. Pavement repairs should be made as soon as possible, even when they may be considered minor. Repairing small distresses initially and at a relatively small cost, can save large amounts of money in the future. A delay in repairing pavements may allow minor distresses to progress into major failures, thus needing large-scale costly repairs.

**Figure 7.5** displays a cross section of pavement with various crack types.



**Figure 7.5: Distressed Pavement (Cracking)**

Repair procedures to prevent further pavement damage may be limited by weather conditions. For example, filling cracks is more effective in cool and dry weather conditions, whereas pothole patches adhere best during warm and dry days. Seal coats and other surface treatments require warm and dry weather for best results.

## Portland Cement Concrete (PCC) Pavement Distresses

Discussions of problems relating to pavement distress are generally based on pavement type; concrete or bituminous. However, while each has its own particular characteristics, the various pavement distresses for bituminous and concrete pavements generally fall into one of the following broad categories: cracking, distortion, disintegration, or skid resistance. The repair procedures discussed in this chapter are only suggested and in no way should be taken over the advice of an experienced engineer who should be consulted before undertaking any large repair project.

## Crack Repair And Sealing

Cracking often results from stresses caused by contraction or warping of the pavement. Overloading, loss of sub-grade support, insufficient and/or improperly cut joints acting singularly or in combination are also possible causes. Sealing should be considered only for cracks that are open wide enough to allow the entry of joint sealant or mechanical routing tools. The following sections describe types of cracks in concrete pavements, along with some suggested repair procedures.



### **Longitudinal, Transverse, And Diagonal Cracks**

Longitudinal, transverse, and diagonal cracks are usually caused by a combination of repeated loads and shrinkage stresses and are characterized by cracks which divide the slab into two or more pieces.

#### Repair Procedure

- Route out a groove about 3/8 inch wide and 3/4 inch deep around the crack.
- Clean out with compressed air. The crack must be free of dirt, dust, and other material that might prevent bonding of the sealant.
- Fill the crack with sealant materials.

### **Corner Cracks**

Corner cracks are caused by load repetition combined with loss of support and curling stresses. This type of break is characterized by a crack that intersects the joints at a distance less than one-half of the slab length on both sides, measured from the corner slabs. A corner crack differs from a corner spall in that the crack extends vertically through the entire slab thickness, while a corner spall intersects the joint at an angle.

#### Repair Procedure

The following procedure is used to repair corner cracks accompanied by loss of sub-grade support. For low severity cracks, the procedure for crack sealant should be used:

- Make a vertical cut with a concrete saw and remove the broken corner.
- Add subbase material, if necessary, and compact.
- Clean the vertical faces of the remainder of the slab with a high-pressure water jet or compressed air.
- Coat the faces of the adjacent slab with a bond-breaking compound to prevent bonding of the new concrete.
- Maintain the existing joint by using temporary inserts or by sawing the required kerf.
- Coat the clean surface with sand-cement epoxy grout.
- Place the Portland Cement Concrete in the patch area while the grout is still tacky.
- After the concrete has cured, remove the joint inserts or saw a kerf.
- Seal joints

### **“D” Cracking**

“D” cracking usually appears as a pattern of cracks running in the vicinity of and parallel to a joint or linear crack. It is caused by the concrete's inability to withstand environmental factors such as freeze-thaw cycles.

#### Repair Procedure

The repair procedure of this type of distress usually requires that the complete slab be repaired since normally “D” cracking will show up again adjacent to the repaired areas.

## **Joint Seal Damage**

Joint seal damage is any condition which enables soil or rocks to accumulate in the joints or allows infiltration of water. Accumulation of materials prevents the slabs from expanding and may result in buckling, shattering, or spalling. Typical types of joint seal damage include stripping, extrusion, hardening of the joint sealant, loss of bond with the slab edges, and the absence of sealant in the joint. Joint sealant damage is caused by improper joint width, use of the wrong type of sealant, incorrect application, and/or not cleaning the joint properly before sealing.

### Repair Procedure

- Use joint router to remove the joint sealing material to a depth of at least 1 inch.
- Reface the sides of the joint to expose sound concrete that is free of old sealer. This may be accomplished with a power saw.
- Use a power wire brush to remove debris.
- Blow out the joints with compressed air.
- Seal joints with hot or cold compounds. Hot poured sealants should be injected into the joint through nozzles shaped to penetrate into the joint and fill the gap from the bottom. On small jobs, hand-pouring pots may be used.

## **Disintegration**

Disintegration is the breaking up of a pavement into small, loose particles and is caused by improper curing and finishing of the concrete, unsuitable aggregates, and improper mixing of the concrete. It also includes dislodging of aggregate particles. If not corrected in the early stages, disintegration can progress until the pavement requires complete rebuilding. The following sections describe types of disintegration distress along with some suggested repair procedures.

### **Scaling, Map Cracking, And Crazeing**

Scaling, map cracking, and crazing refer to a network of shallow hairline cracks that extend only through the upper surface of the concrete. Crazing usually results from improper curing and/or finishing of the concrete and may lead to scaling of the surface. Scaling is the disintegration caused by improper curing or finishing, freeze-thaw cycles, and unsuitable aggregate.

### Repair Procedure

- Make a vertical cut with a concrete saw about 1 to 2 inches deep at the perimeter of the scaled area.
- Break out the broken concrete with pneumatic tools until sound concrete is exposed.
- Clean the area with compressed air or high-pressure water jet.
- Coat the surface of the old concrete with a thin coat of sand-cement grout. Dampen the surface with water before applying the grout.
- Place the Portland Cement Concrete while the grout is still wet.
- If the patch crosses or abuts a working joint, the joint must be continued through the patch.

### **Joint Spalling And Corner Spalling**

Joint spalling often results from excessive stresses at the joint or crack caused by infiltration of incompressible materials. Weak concrete at the joint (caused by overworking at the time of construction) combined with traffic loads is another cause of spalling. Joint spalling is the breakdown of the slab edges within 2 feet of the side of the joint. A joint spall usually does not extend vertically through the slab but intersects the joint at an angle.

Corner spalling is the raveling or breakdown of the slab within approximately 2 feet of the corner. It differs from a corner break in that the spall usually angles downward to intersect the joint while a break extends vertically through the slab.

#### Repair Procedure

- Make a vertical cut with a concrete saw 1 inch in depth and approximately 2 inches behind the spalled area.
- Break out the unsound concrete with air hammers or pneumatic drills and blowout the area with compressed air.
- Pressure rinse the area to be replaced.
- Treat the surface with a grout mixture to insure a good bond between the existing pavement and the new concrete. Apply the grout immediately before placing the patch mixture and spread with a stiff broom or brush to a depth of 1/16 inch.
- Place a thin strip of wood or metal coated with bond-breaking material in the joint groove and tamp the new mixture into the old surface. The mix should be air-entrained and designed to produce concrete without a slump which will require tamping to place in the patch.
- After edging of the patch has been completed, it should be finished to a texture matching the adjacent area.
- After curing for a minimum of 3 days, the open joint should be filled with joint material prior to opening to traffic.

### **Blowups**

Blowups usually occur at a transverse crack or joint. They generally occur in hot weather, usually at a transverse crack in the joint that is not wide enough to permit expansion of the concrete slabs. Insufficient width is usually caused by infiltration of incompressible materials into the joint space. When expansion cannot relieve enough pressure, a localized upward movement of the slab edges (buckling) or shattering will occur in the vicinity of the joint. Blowups normally occur only in thin pavement sections.

#### Repair Procedure

- Make a vertical cut with a concrete saw approximately 6 inches outside of each end of the broken area.
- Break out the concrete with pneumatic tools and remove concrete down to the subbase/sub-grade material.
- Add subbase material, if necessary, and compact.

- In reinforced pavement construction, joint techniques should be used to tie the new concrete to the old reinforced material. Any replacement joints should be doweled and built to joint specifications. For simplicity of construction, all tiebars, dowels, and reinforcement may be omitted from small interior pavement patches on well compacted subgrades.
- Dampen the sub-grade and the edges of the old concrete.
- Place the concrete on the area to be patched.
- Use ready-mixed concrete if it is satisfactory and can be obtained economically. It may be desirable to use a mixture providing high early strength in order to permit the earliest possible use.
- Finish the concrete so that the surface texture resembles that of the existing pavement.
- Immediately after completing the finishing operations, the surface should be properly cured. Either a moist cure or curing compound may be used.

### **Shattered Slab**

Shattered Slab is defined as a slab where intersecting cracks break up the slab into four or more pieces. This is caused by overloading and/or inadequate foundation support.

#### Repair Procedure

Follow the same procedures for blowup repairs except that unstable sub-grade materials should be removed to a minimum depth of 12 inches and replaced with select material. Poor drainage conditions should be corrected by the installation of drains to remove excess water.

## **Distortion**

Distortion is a change in the pavement surface from its original position and results from foundation settlement, expansive soils, frost susceptible soils, or loss of fine grain soils through improperly designed subdrains of the drainage system. If not too extensive, some forms of distortion such as from settlement can be remedied by raising the slab to the original grade. The following sections describe types of distress due to distortion along with some suggested repair procedures.

### **Pumping And Settlement**

Pumping is characterized by the ejection of material by water through joints or cracks, caused by deflection of the slab under passing loads. As the water is ejected, it carries particles of gravel, sand, clay, or silt resulting in a progressive loss of pavement support that can lead to cracking. Surface staining and base or sub-grade material on the pavement close to joints or cracks are evidence of pumping. Pumping near joints indicates a poor joint seal and the presence of ground water.

Settlement or faulting is a difference in elevation at a joint or crack caused by upheaval or differential consolidation. This condition may result from loss of fine grain soils from frost heave or from swelling.

### Repair Procedure

Slabjacking procedures may be used to correct this type of distress. In slabjacking, a grout is pumped under pressure through holes bored in the pavement into the space under the pavement. This creates an upward pressure on the bottom of the slab in the areas around the space. The upward pressure lessens as the distance from the grout hole increases. Thus, it is possible to raise one corner of a slab without raising the entire slab. Because of the special equipment and experience required, slabjacking is usually best done by specialty contractors.

## **Skid Resistance**

Skid resistance refers to the ability of a pavement to provide a surface with good friction characteristics under all weather conditions and is a function of the surface texture or the buildup of contaminants. The idea is to have enough surface friction to prevent skidding. Treatment includes resurfacing, grooving, milling, and surface cleaning. The following sections describe distresses leading to a loss in skid resistance along with some suggested repair procedures.

### **Polished Aggregates**

Some polished aggregates will become polished quickly under traffic. Others are naturally polished and will be a skid hazard if used in the pavement without crushing.

### Repair Procedure

Since polished aggregate distress normally occurs over an extensive area, grooving or milling of the entire pavement surface should be considered. Concrete or bituminous resurfacing may also be used to correct this condition.

### **Contaminants**

Contaminants such as rubber deposits building up over a period of time will reduce the surface friction characteristics of a pavement.

### Repair Procedure

Rubber deposits may be removed by use of high-pressure water or biodegradable chemicals. Any water discharges from this activity should not be allowed to enter the storm drainage system.

### Bituminous Concrete Patches For Concrete Pavement:

Broken concrete areas can be patched with bituminous concrete as an interim measure. Repair for corner cracks, diagonal cracks, blowups, and spalls can be made using the following procedure

- Make a vertical cut with a concrete saw completely through the slab.
- Break out the concrete with pneumatic tools and remove the broken concrete down to the subbase/sub-grade material.
- Add subbase/sub-grade material if required and compact.
- Apply prime coat to subbase material.
- Apply tack coat to sides of slab.

- Place bituminous concrete in layers not exceeding 3 inches.
- Compact each layer with a vibratory-plate compactor, roller, or mechanical rammers.

Normal traffic may be permitted on bituminous patches immediately after completion of the patch.

## Bituminous Pavement Distresses

### Cracking

Cracking in bituminous pavements is caused by deflection of the surface over an unstable foundation, shrinkage of the surface, poorly constructed lane joints, or reflective cracking. Cracking takes many forms and in some cases, simple crack filling may be the proper corrective action. In others, complete removal of the cracked area and the installation of drainage may be necessary. The following sections describe types of cracking found in bituminous pavements along with some suggested repair procedures.

#### Longitudinal And Transverse Cracks

Longitudinal and transverse cracks are caused by shrinkage of the bituminous concrete surface. Longitudinal cracks are also caused by poorly constructed lane joints.

##### Repair Procedure

Narrow cracks (less than 1/8 inch) are too small to seal effectively. In areas where narrow cracks are present, a seal coat, slurry seal, or fog coat may be applied. Wide cracks (greater than 1/8 inch) should be sealed using the following procedure:

- Clean out crack with compressed air to remove all loose particles.
- Fill cracks with a prepared joint sealer.

#### Alligator Or Fatigue Cracks

Alligator Cracks are interconnected cracks that form a series of small blocks resembling an alligator skin. They may be caused by fatigue failure of the bituminous surface under repeated loading or by excessive deflection of the surface over an unstable foundation. The unstable support is usually the result of water saturation of the bases or sub-grade.

##### Repair Procedure

Permanent repairs by patching may be carried out as follows:

- Remove the surface and base as deep as necessary to reach a firm foundation. In some cases, a portion of the sub-grade may also have to be removed. A power saw should be used to make a vertical cut through the pavement. The cut should be square or rectangular.
- Replace base material with material equal to that removed. Compact each layer placed.
- Apply prime coat to the base material and vertical faces of existing pavement.
- Place bituminous concrete and compact.
- Temporary repairs can be made by applying a seal coat to the affected area.

## **Block Cracking**

Block cracking is caused by shrinkage of the asphalt concrete and daily temperature cycles which result in daily stress/strain. These are interconnected cracks that divide the pavement into approximately rectangular pieces. The occurrence of this type of distress usually indicates that the asphalt has hardened significantly. Block cracking generally occurs over a large portion of the pavement area and may sometimes occur only in non-traffic areas.

### Repair Procedure

If serious, the pavement slab should be replaced.

## **Slippage Cracks**

Slippage cracks are caused by braking or turning wheels which cause the pavement surface to slide and deform. This usually occurs when there is a low-strength surface mix or poor bond between the surface and the next layer of pavement structure. These cracks are crescent or half-moon shaped having two ends pointed away from the direction of traffic.

### Repair Procedure

One repair method commonly used for slippage cracks involves removing the affected area and patching with plant-mixed asphalt material. The specific steps are as follows:

- Remove the slipping area and at least 1 foot into the surrounding pavement. Make the cut faces straight and vertical. A power pavement saw makes a fast and neat cut.
- Clean the surface of the exposed underlying layer with a broom and compressed air.
- Apply a light tack coat.
- Place enough hot plant-mixed asphalt material in the cutout area to make the compacted surface the same grade as that of the surrounding pavement.

## **Reflection Cracks**

Reflection cracks are caused by vertical or horizontal movements in the pavement beneath an overlay brought on by expansion and contraction with temperature and moisture changes. These cracks in asphalt overlays reflect the crack pattern in the underlying pavement. They occur most frequently in asphalt overlays on Portland Cement Concrete pavements. However, they may also occur on overlays of asphalt pavements wherever cracks in the old pavement have not been properly repaired.

## **Disintegration**

Disintegration in a bituminous pavement is caused by insufficient compaction of the surface, insufficient asphalt in the mix, or overheating of the mix. If not stopped in its early stages, disintegration can progress until the pavement needs complete rebuilding. The following section describes a type of disintegration found in bituminous pavements along with a suggested repair procedure.

## **Raveling**

Raveling is the wearing away of the pavement surface caused by the dislodging of aggregate particles and loss of asphalt binder. As the raveling continues, larger pieces break free, and the pavement takes on a rough and jagged appearance.

### Repair Procedure

Further deterioration from raveling may be prevented by the following:

- Sweep the surface free of all dirt and loose aggregate material.
- Apply a fog seal diluted with equal parts of water.
- Close area to traffic until the seal has cured.
- Apply a surface treatment such as an aggregate seal coat.
- A pavement planning machine, such as a heater-plane, may be used to soften the surface of the pavement; then, apply a seal coat or bituminous overlay.

## **Distortion**

Distortion in bituminous pavements is caused by foundation settlement, insufficient compaction of the pavement courses, lack of stability in the bituminous mix, poor bond between the surface and the underlying layer of the pavement structure, or swelling soils or frost action in the sub-grade. Repair techniques range from leveling the surface by filling with new material to complete removal of the affected area and replacing with new material. The following sections describe types of distortion found in bituminous pavements along with some suggested repair procedures.

### **Rutting**

Rutting is characterized as a surface depression in the wheel path. Ruts are most often noticeable only after a rainfall when the wheel paths are filled with water. This type of problem is caused by a permanent imperfection in any of the pavement layers or the sub-grade and its cause is due to traffic loads.

### Repair Procedure

- Determine how serious the rutting problem is by measuring with a straightedge or stringline. Outline the areas to be filled.
- Apply a light tack coat of asphalt emulsion diluted with equal parts of water.
- Spread dense-graded asphalt concrete with paver and compact. Be sure that the material is feathered at the edge.
- Place a thin overlay of bituminous concrete over the entire area.

### **Corrugation And Shoving**

Corrugation results from a form of plastic surface movement typified by ripples across the surface. Shoving is a form of plastic movement resulting in localized bulging of the pavement surface. Corrugation and shoving can be caused by lack of stability in the mix and poor bond between material layers.



### Repair Procedure

The repair procedure for this type of distress is the same as for patch repair or alligator cracking described previously.

## **Depressions**

Depressions are localized low areas of limited size. In many instances, light depressions are not noticeable until after a rain, when pounding creates “birdbath” areas. Depressions can be caused by heavier traffic than what the pavement was designed for, by localized settlement of the underlying layers, or by poor construction methods.

### Repair Procedure

- Determine the limits of the depression with a straightedge or stringline. Outline it on the pavement surface with a marking crayon.
- If grinding equipment is available, grind down the area to provide a vertical face around the edge. If this equipment is not available, this step may be omitted.
- Thoroughly clean the entire area to at least 1 foot beyond the marked limits.
- Apply a light tack coat of asphalt emulsion diluted with equal parts of water to the cleaned area.
- Allow the tack coat to cure.
- Spread enough bituminous concrete in the depression to bring it to the original grade when compacted. The correct way to repair a deep depression is to begin in the deepest part of the depression and place a thin layer, the surface of which when compacted, will be parallel to the original pavement surface. Successive layers are placed in the same manner.
- If the pavement was not ground down, the edges of the patch should be feather-edged by careful raking and manipulation of the material. However, in raking, care should be taken to avoid segregation of the coarse and fine particles of the mixture.
- Thoroughly compact the patch with a vibrator-plate compactor, roller, or hand tamps.

## **Swelling**

Swelling is characterized by an upward bulge in the pavement's surface. It may occur sharply over a small area or as a longer gradual wave. Both types of a swell may be accompanied by surface cracking. A swell is usually caused by frost action in the sub-grade or by swelling soil.

### Repair Procedure

The repair procedure is the same as for patch repair or alligator cracking described previously.

## **Skid Resistance**

Factors which decrease the skid resistance of a pavement surface include too much asphalt in the bituminous mix, too heavy a prime coat, poor aggregate subject to wear, and buildup of contaminants. Treatment includes removal of excess asphalt, resurfacing, grooving to improve surface drainage, and removal of rubber deposits. The following sections describe factors which contribute to lower skid resistance along with some suggested repair procedures.

**Bleeding**

Bleeding is characterized by a film of bituminous material on the pavement surface which resembles a shiny, glass-like reflecting surface that usually becomes quite sticky. It is caused by excessive amounts of asphalt cement or tars in the mix and/or low air-void content and occurs when asphalt fills the pavement. Since the bleeding process is not reversible during cold weather, asphalt or tar will accumulate on the surface. Extensive bleeding may cause a severe reduction in skid resistance.

Repair Procedure

Repair procedures using hot sand or aggregate are as follows:

- Apply slag screenings, sand, or rock screenings to the affected area. The aggregate should be heated to at least 300°F and spread at the rate of 10 to 15 pounds per square yard.
- Immediately after spreading, roll with a rubber-tired roller.
- When the aggregate has cooled, sweep off loose particles.
- Repeat the process, if necessary.
- A pavement planing machine, such as a heater-planer, may be used to remove the excess asphalt; specifically:
  - Remove the asphalt film with a heater-planer,
  - Leave the surface as planed, or
  - Apply either a plant-mixed surface treatment or seal coat.

**Polished Aggregate**

Polished aggregate is caused by repeated traffic applications. It occurs when the aggregate extending above the asphalt is either very small or poor quality, or contains no rough or angular particles to provide good skid resistance.

Repair Procedure

One means of correcting this condition is to cover the surface with an aggregate seal coat. Grooving or milling the pavement surface may also be used.

**Fuel Spillage**

Fuel spillage on bituminous surfaces over time will soften the asphalt. Areas subject to only minor fuel spillage will usually heal without repair, and only minor damage will result.

Repair Procedure

Permanent repairs for areas subjected to continuous fuel spillage consist of removal of the damaged pavement and replacement with Portland Cement Concrete or an overlay with a tar emulsion seal coat.

**Contaminants**

Contaminants, such as rubber, over a period of time will reduce the skid resistance of a pavement.

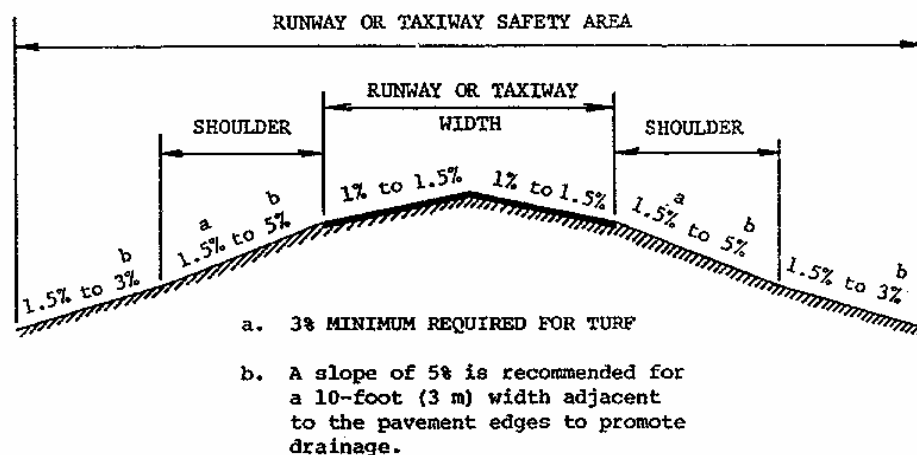
Repair Procedure

Rubber deposits may be removed by using high-pressure water or biodegradable chemicals. Discharges from this activity should be prohibited from entering the storm drainage system.

## Drainage

A proper drainage system is a fundamental consideration of preventive maintenance. Pavement failures should always be investigated for inadequate drainage. Probably no other factor plays such an important role in determining the ability of a pavement to withstand the effects of weather and traffic. The purpose of airport drainage is to dispose of the water which may interfere with the safe and efficient operation of the airport. The drainage system collects and removes surface water runoff, removes excess underground water, lowers the water table, and protects all slopes from erosion. An inadequate drainage system can cause saturation of the sub-grade and subbase, damage to slopes by erosion, and loss of the load-bearing capacity of the paved surfaces.

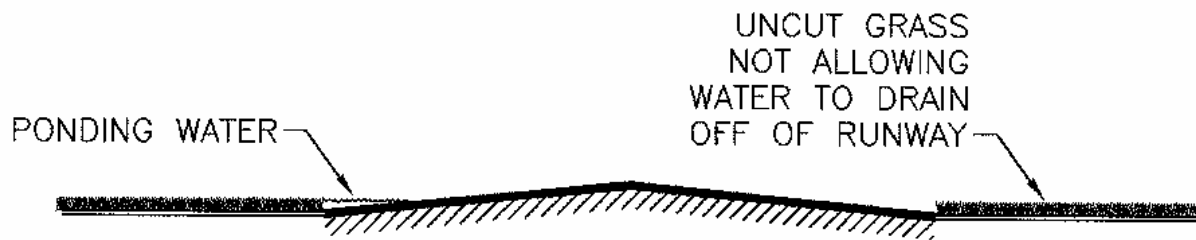
Water damage to pavement is related to the amount of water in the boundaries between the structural layers of the pavement. When water fills the voids and spaces at the boundaries between the layers, heavy wheel loads applied to the surface of the pavement produce impacts on the water that are comparable to a water-hammer type action. The resulting water pressure causes erosion of the pavement structure and ejection of material out of the pavement. Drainage is discussed in detail in the FAA Advisory Circular AC 150/5320-5B "Airport Drainage." **Figure 7.6** illustrates recommended grade slopes for proper runway and taxiway drainage. **Figure 7.7** illustrates the effects an improper drainage slope can cause on runways and taxiways.



### GENERAL NOTES:

1. A 1.5 inch (3.8 cm) drop from paved to unpaved surfaces is recommended.
2. Drainage ditches may not be located within the safety area.

**Figure 7.6: Recommended Proper Grade Slopes For Runways And Taxiways**



**Figure 7.7: Effects On Runways And Taxiways From Poor Drainage Slopes**

There are two classes of drainage systems, surface and subsurface. Classification depends on whether the water is on or below the surface of the ground at the point where it is first intercepted or collected for disposal. Where both types of drainage are required, it is generally better for each system to function independently.

The purpose of surface drainage is to control and collect water from rainstorms and melting snow and ice. Surface drainage of pavements is achieved by constructing the pavement surface to allow for adequate runoff. Surface water may be collected at the edges of the paved surface in ditches, gutters, and catch basins. Inevitably, some water will enter the pavement structure through cracks, open joints, and other surface openings, but this may be kept to a minimum by proper surface maintenance procedures.

Subsurface drainage is provided for the pavement by a highly permeable layer of sand-aggregate mixture placed under the full width of the travel way. Longitudinal pipes for collecting the water and an outlet removes excess water from the subsurface drainage system. Drainage removes excess water from pavement foundations to prevent weakening of the base and sub-grade layers and to reduce damage from frost action.

## Pavement Inspection

While deterioration of pavement due to usage and exposure cannot be completely prevented, a timely and effective maintenance program can reduce this deterioration to a minimum level. Lack of adequate and timely maintenance is the single greatest cause of pavement deterioration. The maintenance inspection can reveal at an early stage where a problem exists and, thus, provide the warning and time to permit a corrective repair project. Postponing a minor maintenance item can develop into a major costly pavement repair project.

## Inspection Procedures

Maintenance is a continuous function and is the responsibility of airport personnel. A series of scheduled, periodic inspections, conducted by an experienced engineer or trained maintenance personnel, must be carried out in an effective maintenance program. These surveys must be controlled to insure that each element or feature being inspected is thoroughly checked, that

potential problem areas are identified, and that proper corrective measures are recommended. The maintenance program must provide for adequate follow-up to determine that the corrective work is quickly accomplished and recorded. Although the organization and extent of maintenance activities will vary from airport to airport, the general types of maintenance are relatively the same regardless of airport size or extent of development.

**What to do:** Inspection of all paved or surfaced areas should be scheduled at least twice a year. One inspection should be scheduled for spring and one for fall. Any unusual storms or other conditions which might have a generally adverse effect on the pavements would also necessitate a complete inspection.

**What to look for:**

1. Unsealed old cracks and joints
2. Random cracking (transverse, longitudinal, corner)
3. Surface breakup (scaling, raveling)
4. Joint faulting or spalling
5. Pumping or rocking of slabs
6. Surface irregularities (bird baths, washboard)
7. Bleeding
8. Potholing
9. Bitumen oxidation
10. Map cracking, alligator cracking, crazing
11. Pop-outs or slab blowup
12. Slipperiness
13. Extruded joint material
14. Bitumen erosion from solvents
15. Miscellaneous settlement
16. Surface rutting or grooving
17. Binder stripping
18. Broken curbs and walks

## Materials, Equipment And Manpower

Normal day-to-day pavement maintenance requires only hand tools, but certain specialized equipment may sometimes be needed. Routing-out of joints in concrete pavements is best accomplished by a hand operated, motor-driven machine especially designed for that purpose. Joint sealing can be accomplished by hand pouring from kettles with narrow spouts, but some sealing materials require pressure application and must be applied with specialized equipment.

If concrete slabs must be broken, the use of mechanical hammers is recommended (air, gasoline, electric). These hammers can also be used for drilling slabs. Large-scale work, for example seal coating of extensive areas, requires specialized equipment, such as pressure distributors for bitumens, aggregate spreaders, and rollers. As a general rule, work of this type is performed by contractors or others organized for such large-scale activities.

Patching and spot sealing can be speeded up by using trailer-type asphalt kettles. Those equipped with a powered handspray bar are valuable maintenance and repair items. Compaction of patches can be accomplished with hand tampers but better results can be assured if small vibrating compactors are used. These vibrating compactors are easy to operate, transportable in small vehicles, can work in very confined areas, and do an excellent job.

Two to six men, trained in the various techniques of repairing and familiar with the tools available to them, can perform the routine maintenance required on the pavement surfaces. Work requiring more than this size crew would normally be considered as a major repair and will require application of methods, materials, and equipment beyond the normal maintenance project.

## References

Federal Aviation Administration Advisory Circular AC 150/5380-6A, "Guidelines and Procedures for Maintenance of Airport Pavements"

Federal Aviation Administration Advisory Circular AC 150/5380-7A, "Pavement Management System"

Federal Aviation Administration Advisory Circular AC 150/5320-5B, "Airport Drainage"

# Chapter 8 - Airport Navigational Aids

## Navigational Aids (NAVAIDS)

An airport's Visual and Navigational Aids (NAVAIDS) primary function is to assist pilots in the safe and efficient movement of aircraft during landing, takeoff, and taxiing maneuvers. It is therefore very important to have all visual and navigational aids working properly and maintained in good condition.

This chapter will briefly discuss various visual and navigational aids, provide general suggestions on inspection procedures of the more standard visual and navigational aids located on most general aviation facilities, and discuss safety procedures when maintaining such equipment.

The FAA recently revised their Advisory Circular 150/5340-26A dated 4/4/2005 titled "Maintenance of Airport Visual Aid Facilities" which is incorporated herein by reference. The AC provides system maintenance information for establishing at your airport a preventative maintenance program for airport visual aid facilities. The information in the AC covers the following systems:

- Airport lighting vault and series lighting circuits
- Constant Current Regulators (CCR)
- Runway and taxiway elevated edge lighting systems
- Runway and taxiway in-pavement lighting systems
- Runway guard lights and stop bar lights
- Illuminated runway and taxiway signs
- Rotating beacons
- Lighted wind cone assemblies
- Precision Approach Path Indicator (PAPI) systems
- Visual Approach Slope Indicator (VASI)
- Runway End Identifier Lights (REIL) and Omni directional Approach Light System (ODALS)
- Medium Intensity Approach Light System (MALSL, MALSL/F, MALSL/R)
- Hazard beacons and obstruction lights
- Control systems
- Standby engine generator systems

In addition to the visual aid facilities equipment topics, the circular also covers recommended safety practices and suggested troubleshooting procedures for airport series lighting circuits.

## Other Types of Visual Aids

### *Retroreflective Markers*

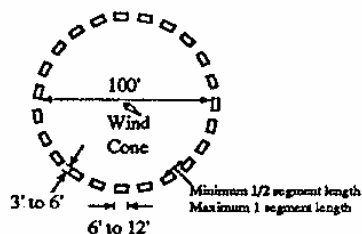
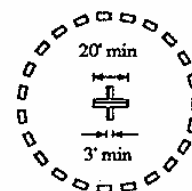
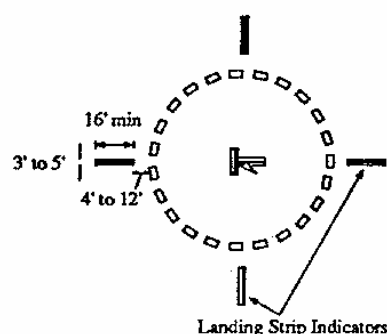
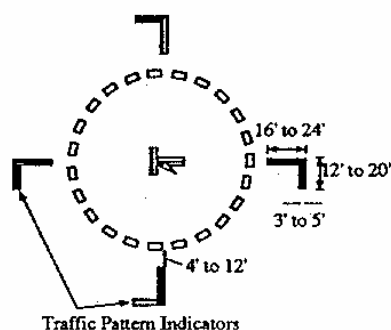
Retroreflective markers or reflectors are very useful to pilots on any airport. These reflectors are the same as those on roads. Taxiway centerlines are marked with green colored markers and edges are marked with blue markers. Reflectors are placed at least every 25 feet in straight ways and 12.5 feet in turns. Reflectors are also placed on runways along the extended exit taxiway centerline turnoffs.

In 1983 the FAA Technical Center conducted a study “Identification of Exit Taxiways (Retroreflective Markers Only)” and published their findings in DOT/FAA/CT-83-5, DOT/FAA/RD-82/91 dated April 1983. in summary “The results indicate that there was an improvement in the pilots ability to identify the exit taxiway associated with the exit-taxiway retroreflectors. The results also show that the retroreflectors should be placed on an arc from near the runway centerline to the taxiway centerline using a cord spacing of 12.5 feet”. The LA DOTD Aviation Section has adopted this recommendation as a basic visual aid that should be installed at all runway exit taxiway intersections.

### ***Segmented Circle***

Segmented circles aid the pilot in locating obscure airports and provide a centralized location for such signal devices as may be required on a particular airport. Wind direction is indicated with a wind cone which should be lighted either internally or externally. Landing strip indicators are arranged outside the segmented circle indicating the orientation of the landing strip. Landing direction indicators are used to show pilots the direction in which landing and takeoffs are to be made. Traffic pattern indicators are arranged outside the segmented circle when there is any variation from the normal left-handed pattern. Several varieties of segmented circles are shown in **Figure 8.1**.



**Segmented Circle with  
Wind Direction Indicator****Segmented Circle with  
Landing Direction Indicator****Segmented Circle with  
Closed Field Indicator****Segmented Circle with  
Landing Strip Indicators****Segmented Circle with  
Traffic Pattern Indicators****Figure 8.1: Segmented Circle Configurations**

## Electronic NAVAIDS

### *Nondirectional Beacon (NDB)*

The nondirectional beacon (NDB) radiates a low or medium frequency signal which provides directional guidance to and from a transmitting antenna. A pilot whose aircraft is properly equipped can determine his bearing and “home” on the station. A NDB is normally mounted between two 55 foot poles forming a symmetrical “T” Antenna and may be located on or off the airport. It is preferable for the NDB to be located off the airport on the runway extended centerline between 4 to 6 nautical miles from the runway threshold. In 2002 and 2003 the LADOTD Aviation Division replaced all of the existing non-federal NDB systems statewide to increase reliability. The new NDB systems were manufactured by Nautel Limited, 201 Target Industrial Circle, Bangor, ME 04401, tel 207-947-8200, fax 207-947-3693. The system consists of a ND200S 50 watt transmitter, NX500TUB (FAA9782/1) Automatic Tuning Unit, Replacement T-20 “T” Antenna system, NRB4 Monitor Alarm Receiver with NLA/2 Active Ferrite Loop Antenna, and a NAB05A Battery Charger.

### ***Localizer Antenna***

The localizer (LOC) antenna emits a signal which is used to establish and maintain the aircraft's horizontal position until the pilot visually confirms the runway alignment and location. The LOC antenna is located on the extended runway centerline 1,000 to 2,000 feet beyond the stop end of the runway. In 1994 the LA DOTD Aviation Section replaced all of the existing non- federal LOC systems with the Mark 10 system.

To receive LOC funding from the LA DOTD Aviation Section, an airport must have a minimum runway 5000 foot in length with a minimum of 75 feet in width, (TORA 5000, TODA 5000, ASDA 5000 LDA 5000), Non-Precision Runway Markings, mandatory signage located 250 feet from all runway / taxiway and runway / runway intersections, an NDB installed as a compass locator on the runway extended centerline between 4 to 6 nautical miles from the runway threshold, a PAPI-2 or PAPI-4 with a 3° glidepath and 50 foot Threshold Crossing Height (TCH), a 34:1 or better approach obstruction clearance, a Runway Protection Zone with FAA standard dimensions for all aircraft approach categories with not lower than ¾ mile visibility. (length 1700 feet, inner width 1000 feet, outer width 1510 feet).

### ***Glide Slope Antenna***

The glide slope (GS) signal, which is the critical component of the Instrument Landing System (ILS), is used to establish and maintain the aircraft's descent rate until the aircraft's pilot visually confirms the runway alignment and location. A glide slope differentiates precision from nonprecision approaches. The GS may be located on either side of the runway but must be located on the opposite side of the parallel taxiway to prevent aircraft from causing GS signal interruption at non-towered airports.

In addition to the LOC requirements to receive GS funding from the LA DOTD Aviation Section an airport must have a minimum of a 100 foot in width runway with a full parallel taxiway, Precision Runway Markings, a 50:1 or better approach obstruction clearance, a Runway Protection Zone with FAA standard dimensions for all aircraft approach categories with lower than ¾ mile visibility. (length 2500 feet, inner width 1000 feet, outer width 1750 feet), an AWOS-3 P/T or ASOS, and either an RCO / GCO or dedicated 24 hour land-line for communications to ATC and / or FSS. In addition, the airport's runway lighting system must have a 24 hour emergency generator with an automatic transfer switch rated for continuous service.

### ***Automatic Weather Observation Stations (AWOS)***

Automatic recording instruments were developed to measure varying weather conditions such as cloud height, visibility, wind speed and direction in order to alert pilots of severe or dangerous weather. FAA Advisory Circular AC 150/5220-16, "Automated Weather Observing Systems (AWOS) for Non-Federal Applications" provides additional guidance. The AWOS-3 P/T system is the standard system configuration in Louisiana. Currently all of the AWOS systems installed in Louisiana are manufactured by Vaisala. See Chapter 15 "Local Altimeters" for further information.

## ***Ground Communication Outlet (GCO)***

The GCO is an unstaffed, remotely controlled, ground/ground communications facility. Pilots at uncontrolled airports may contact ATC and FSS via VHF to a telephone connection to obtain an instrument clearance or close a VFR or IFR flight plan. They may also get an updated weather briefing prior to takeoff. Pilots will use four “key clicks” on the VHF radio to contact the appropriate ATC facility or six “key clicks” to contact FSS. The GCO system is intended to be used only on the ground.

Once the GCO is activated by a pilot the VHF base station dials a preprogrammed ATC telephone number for direct communication with center or the toll free FSS number. The combination of VHF radio and dial-up telephone link is the most cost effective manner to enable a direct communication link between an aircraft and FAA ATC or FSS facilities. The GCO is designed to eliminate the mandatory pay phone requirements for airports with a published instrument approach.

Additionally, the GCO equipment has the capability of allowing the appropriate ATC facility or the FSS to initiate a call over the GCO facility, with an assigned programmable security code, to pilot using your airport. We anticipate that the airport’s GCO would be assigned a frequency of 135.075MHz. The airport’s GCO frequency would be published in the Airport/Facility Directory and the U.S. Terminal Procedures Publication for your airport under the topic “Communications”.

If an airport would want to request a GCO facility, the LA DOTD Aviation Section requires a dedicated telephone line be permanently made available, at the airport’s expense. The State would purchase and furnish the GCO equipment and reimburse the airport’s initial telephone installation costs and GCO equipment installation costs performed by your non-federal technician.

There are no annual or monthly recurring equipment or service costs for the GCO other than telephone line expenses for the airport to participate in the program. The monthly recurring telephone expenses may be eligible for 50% reimbursement under the State’s GA and Reliever Airport Maintenance Grant Program, based on funds availability from the legislature on an annual basis.

Currently, GCO equipment installed in Louisiana is the ARINC Model 92-SC/TDAT and the Avtech Ground Link Model LA-1000.

## ***UNICOM Radio***

The UNICOM radio is a non-government communications facility which may provide airport information at certain airports. Several frequencies for airports without an operating control tower are available for selection by the airport. These frequencies are 122.700, 122.725, 122.800, 122.975, 123.000, 123.050, and 123.075. LADOTD Aviation recommends that the UNICOM frequency selected should also be the same frequency for the Pilot Radio Controlled Airport Lighting System. Selection of the UNICOM frequency should take into consideration existing UNICOM frequencies used at nearby airports to avoid confusion during pilot broadcasts of location and intentions as they enter the airports airspace.

## **Development of Standards**

The LA DOTD Aviation Section is in the process of developing statewide minimum standards for visual aids and NAVAIDS. These standards will be categorized according to the size of the airports. Although these standards have not yet been officially published, the LA DOTD

Aviation Section has prepared a statewide airport NAVAIDS inventory and management plan that suggests certain minimum standards.

The suggested minimum standards include a fully operational rotating beacon, lighted wind indicator (sock by FAA standard), runway lighting, REILS, and PAPI systems should be considered as minimum visual aid equipment at airports. Taxiway lights are also recommended at larger general aviation facilities.

A standard general aviation airfield should include the following visual NAVAIDS:

- \* 36" Rotating Beacon – L-802
- \* 36" Lighted Wind Indicator
- \* Runway Edge Lights - MIRL
- \* Taxiway Lights (Intersections\*) - MITL
- \* Runway End Identifier Lights - (REILS)
- \* Precision Approach Path Indicators – (PAPI)

\* Indicates "minimum standards"

## Replacement Parts

Replacement parts for airfield lighting and visual aids should be acquired from the original manufacturer, if possible. Otherwise, replacement parts should be acquired from manufacturers whose equipment is listed as approved in FAA Advisory Circular AC 150/5345-53C Appendix 3, or latest edition, entitled "Approved Airport Equipment". Also contact the LA DOTD Aviation Section at (225) 274-4125 for more information and assistance.

**36" Airport Rotating Beacon, 1000 watt ..... Lamp P/N MH 1000 / U / BT 37**

**L-858 – Signs, Quartz 45 Watt ..... Lamp P/N EXM – mfg. by GE**

**L-861 T – Taxiway, Quartz 30 Watt ..... Lamp P/N EXL – mfg. by GE**

**L-861 T – Taxiway, Quartz 45 Watt ..... Lamp P/N EXM – mfg. by GE**

**L-861 – Runway, MIRL, Quartz 45 Watt ..... Lamp P/N EXM – mfg. by GE**

**L-861 – Runway Threshold, MIRL, Quartz 45 Watt ..... Lamp P/N EXM – mfg. by GE**

**L-861SE – Runway Threshold, MIRL, Quartz 120 Watt .... Lamp P/N EVV – mfg. by GE**

**L-862 – Runway Edge, HIRL, Quartz 120 Watt ..... Lamp P/N EVV – mfg. by GE**

**L-862 – Runway Threshold, HIRL, Quartz 200 Watt ..... Lamp P/N EZL – mfg. by GE**

**MFG. P/N or equal**

**EXL = 40737 Crouse-Hinds**

**EXL = 48A0006 Siemens Airfield Solutions, Inc.**

**EXL = 55041 6.6A/30T3.5Q EXL Sylvania**

**EXM = 40732 Crouse-Hinds**

**EXM = 48A0007 Siemens Airfield Solutions, Inc.**

**EXM = 55048 6.6A/45T3.5Q EXM Sylvania**

## **Local Altimeters - AWOS**

Altimeter setting source(s) at your airport may lower landing minimums. A sponsor may want to have a non-federal Automated Weather Observing System (AWOS) to be the primary altimeter source, but to receive LA DOTD Aviation Section funding assistance the AWOS observation data must be transmitted to the FAA's National Airspace Data Interchange Network (NADIN).

## **Altimeter Setting Source Procedures**

The Federal Aviation Administration (FAA) Advisory Circular AC 91-14D "Altimeter Setting Sources" sets forth the proper procedures for altimeter setting sources.

## **System Approvals – Local Altimeter Sources**

Altimeter setting sources are intended for use with approved instrument approach procedures will require initial approval and periodic inspection by the FAA. Initial approval and annual inspections should be accomplished by contacting the FAA Southwest Region Flight Standards District Office (FSDO) in Baton Rouge at (225) 932-5900. Reference AC 91-14D.

## **AWOS-3 P/T Systems**

Automatic weather reporting systems are required to meet FAA and National Weather Service accuracy and reliability standards before they can be used to support instrument flight rule operations. Reference AC 150/5220-16.

The Automated Weather Observing System (AWOS) provides continuous, real-time weather reports, without human involvement, for users of aviation facilities. Each AWOS installation is certified, inspected, and commissioned by the FAA. The non-federal AWOS systems funded by the LA DOTD Aviation Section are configured and designated AWOS-3 P/T systems.

The AWOS-3 P/T provides current altimeter setting, density altitude, temperature, dew point, wind speed and direction with gust indication, visibility, cloud height and sky conditions, precipitation identification and intensity, and thunderstorm reporting with local-area lightning tracking.

Pilots and airport personnel make critical decisions based on the weather. Automated Weather Observing Systems (AWOS) are pilot's reliable guide through ever-changing weather conditions, so informed decisions can be made with confidence.

Lightning-sensitive airport operations rely on the lightning detection sensor to provide critical lightning threat information on the Graphics Weather Display along with VHF transmitter

broadcasts of advance precaution information which allows pilots to initiate avoidance procedures.

The AWOS-3 P/T system includes the following systems to form an operational unit:

Wind measurement, both speed and direction comprising wind vanes, anemometers, combined wind sensors and ultrasonic wind sensors.

Ceilometers which measure cloud heights at 25,000 feet or up to 40,000 feet.

Present Weather sensors combining visibility and present weather sensors that carry out tasks normally requiring a human observer and multiple instruments.

Visibility meters

Dual barometric pressure sensors which is used to determine the altimeter setting for the airport

Relative humidity and air temperature sensors

Additional AWOS peripherals include:

- VHF Ground-to-Air Transmitter broadcasts weather reports, 24 hours a day
- Operator Terminal - GWD Graphic Weather Display and a printer.
- NOTAM Capability - Record and transmit Notices to Airmen (NOTAMs).
- Telephone Access - phone line to access current weather or perform Remote Maintenance Monitoring (RMM) functions.
- Uninterruptible Power Supply
- UHF Data Link

National Airspace Data Interchange Network (NADIN) Connection - Connects the AWOS to the national weather network so that the facility's weather observations are available for flight planning and forecasting to both the FAA and NWS.

## **AWOS-3 P/T Data Link to NADIN**

Pilots choose to prepare for their flights with weather briefings from the Federal Aviation Administration (FAA) Flight Services, Air Traffic Control (ATC), DUATS as well as commercial weather providers, Internet sites, pilot briefing systems and private forecasting companies.

Currently, Louisiana AWOS-3 P/T systems are manufactured by Vaisala. Further, Vaisala recently purchased CLH, Inc. which installed and managed the Z-Link non-federal interface portal system to the FAA NADIN. The Vaisala AviMet<sup>TM</sup> Data Link system replaces the Z-Link system. Louisiana weather observations is incorporated into FAA or NWS weather maps and

briefings using this single source of data distribution to the FAA's Weather Message Switching Center (WMSCR) through the National Airspace Data Interchange Network (NADIN).

## NADIN

### *NATIONAL AIRSPACE DATA INTERCHANGE NETWORK (NADIN)*

The National Airspace Data Interchange Network (NADIN) Message Processing Service (NADIN I) is a store-in-forward message-switched data network. NADIN I is also known as NADIN MSN (Message Switched Service). The initial network will replace and combine the U.S. operated portion of the Aeronautical Fixed Telecommunications Network (AFTN) and Automatic Data Interchange System B (ABDIS). Both of these networks switch Service B information (flight plan data) among FSSs, Air Route Traffic Control Center (ARTCCs), Base Operations (BASOPs), and intentional points. NADIN I will also handle Service B traffic for Flight Service Automation System (FSAS) Model 1, intentional Notice to Airman System (NOTAMs) for selected users, and Service A weather data for ARTCCs.

The majority of users will interface with the network at a NADIN concentrator, located at each ARTCC, where protocol, speed, and Code conversion functions are performed. In a few special cases, users will connect directly to a switch Front-End Processor (FEP). Any NADIN I user will be able to transmit authorized messages to and receive authorized messages from any other NADIN I User.

Each of the two operational NADIN I Switches at Atlanta and Salt Lake City controls its own "star" network of concentrators. Generally, concentrators east of the Mississippi River are assigned to the Atlanta switch, while concentrators west of the Mississippi are assigned to the Salt Lake City switch. Each SWITCH is connected to its assigned SWITCH, and the two Switches are connected to one another by two 9.6 kbps circuits. Under normal conditions, messages are transmitted between their respective assigned switch (es), as follows:

- Traffic between two concentrators connected to the same switch is transmitted via that switch.
- Traffic between concentrators connected to separate switches is transmitted from the originating concentrator to its assigned switch, then to the other switch and then to the receiving concentrator.

Switches are located in separate NADIN buildings at the Atlanta and Salt Lake City ARTCC locations. The switch message traffic bound from one SWITCH to another.

Switches provide users in en route areas with an interface to the NADIN I system. Switches pass all messages from users to a switch for further routing/distribution. The 23 operational Switches are 20 in the Continental United States (CONUS) ARTCCs, and one each at Anchorage, and Honolulu.

The National Airspace Data Interchange Network (NADIN) Packet Switched Network (PSN), commonly known as NADIN II, is part of the data switching sub-element of the NAS communications element and it currently provides, or will provide, high-speed, data communications between other sub-systems in the NAS. The NADIN II, which was

commissioned on March 31, 1995, employs the international Telecommunications Union-Telecommunications Standards Section (ITU-TSS) X.25 (1984 version) protocol and operates 24 hours a day, seven days a week.

NADIN II is an independent X.25 Packet Switched Network (PSN) that augments and functions in parallel with the NADIN I (sometimes incorrectly referred to as NADIN IA) store-and-forward Message Switching Network (MSN). Collectively, both networks are known as NADIN. The NADIN II is a highly robust data communications network composed of packet switching nodes connected by high-speed digital backbone trunks and controlled from a central facility, the Network Control center (NCC). The major functions to be performed by the NCCs are network management and control. However, normal day-to day operation of NADIN II requires no manual (operator) intervention by the NCCs or others; it is fully automatic.

The PSN provides end-to-end connectivity between users and host computers nationwide. NADIN II uses commercially leased circuits, currently LINCS, and the T-carrier portion of the Radio Communications Link (RCL) as the transmission medium to connect the 24 operational NADIN II packet switching nodes. Network services include interactive host-to-host, host-to-terminal, terminal-to-host, and terminal-to-terminal data transfer. The packet switching nodes are multi-processor devices with automatic redundancy. Alternate routing is provided to all node sites, with each node having a minimum of two backbone trunks. NADIN II is an FAA-owned system. Hughes Corporation is the contractor. NADIN II is fully operational.

## References

[www.faa.gov/programs/fti/telesum.htm](http://www.faa.gov/programs/fti/telesum.htm) "Telecommunications Systems Summaries-NADIN"

Federal Aviation Administration Advisory Circular 91-14D, "Altimeter Setting Sources"

Federal Aviation Administration Advisory Circular 150/5070-6B, "Airport Master Plans"

Federal Aviation Administration Advisory Circular 150/5190-4A, "A Model Zoning Ordinance to Limit Height of Objects Around Airports"

Federal Aviation Administration Advisory Circular 150/5220-16C, "Automated Weather Observing Systems (AWOS) for Non-federal Applications"

Federal Aviation Administration Advisory Circular 150/5230-4A, "Aircraft Fuel Storage, Handling, and Dispensing on Airports"

Federal Aviation Administration Advisory Circular 150/5300-13, "Airport Design"

Federal Aviation Administration Advisory Circular 150/5340-5B, "Segmented Circle Airport marker System"

Federal Aviation Administration Advisory Circular 150/5340-18D, "Standards for Airport Sign Systems"

Federal Aviation Administration Advisory Circular 150/5340-26A, "Maintenance of Airport Visual Aid Facilities"

Federal Aviation Administration Advisory Circular 150/5340-30B, "Design and Installation Details for Airport Visual Aids"



Federal Aviation Administration Advisory Circular 150/5345-1V, “Approved Airport Equipment”

Federal Aviation Administration Advisory Circular 150/5345-12E, “Specification for Airport and Heliport Beacon”

Federal Aviation Administration Advisory Circular 150/5345-27D, “Specification for Wind Cone Assemblies”

Federal Aviation Administration Advisory Circular 150/5345-28F, “Precision Approach Path Indicator (PAPI) Systems”

Federal Aviation Administration Advisory Circular 150/5345-39C, “Specification for L-853, Runway and Taxiway Retroreflective Markers”

Federal Aviation Administration Advisory Circular 150/5345-43F, “Specification for Obstruction Lighting Equipment”

Federal Aviation Administration Advisory Circular 150/5345-44G, “Specification for Taxiway and runway Signs”

Federal Aviation Administration Advisory Circular 150/5345-46C, “Specification for Runway and Taxiway Light Fixtures”

Federal Aviation Administration Advisory Circular 150/5345-47B, “Specification for Series to Series Isolation Transformers for Airport Lighting Systems ”

Federal Aviation Administration Advisory Circular 150/5345-49B, “Specification L-854 Radio Control Equipment”

Federal Aviation Administration Advisory Circular 150/5345-51A, “Specification for Discharge-Type Flashing Light Equipment”

Federal Aviation Administration Advisory Circular 150/5345-53C, “Airport Lighting Equipment Certification Program”

Federal Aviation Administration Advisory Circular 150/5370-2E, “Operational Safety on Airports During Construction”

Federal Aviation Administration Advisory Circular 150/5370-10B, “Standards for Specifying Construction of Airports”

# Chapter 9 - Airport Zoning

## Introduction

Simply defined, zoning is the division of a municipal or rural area into districts for the primary purpose of regulating the use of land. It regulates the type and intensity of land use. Intensity is regulated through restrictions on the height of buildings, setback requirements, and lot coverage. The types of land uses comprising a zoning ordinance will keep conflicting land uses apart. In its simplest form, zoning must separate residential uses from commercial uses and industrial uses. These zones are shown on a map. Thus, two elements comprise the zoning ordinance -- the text which details the nature of the primary and accessory uses allowed in each zone and the map which shows where each of the zones is located.

Zoning is an expression of police power -- the power to regulate development activities for the health, safety, morals, and general welfare of the public. In Louisiana, parishes and municipalities are granted this authority through enabling legislation (L.R.S. 33:4721-4732). Zoning should allow for the “highest and best” use of land or the most productive use of land given its location. Furthermore, zoning is the implementation tool and legal document that guides orderly development in concert with local comprehensive plans.

Land use controls may limit selected uses or only certain type activities within broader land use categories. The controls may establish specific building size, unit numbers or area coverage limitations, population density limits, reflectivity and emission controls, materials use prohibitions and storage requirements, or land slope/grading and water retention area limitations. Most of the controls will be necessary only in the very near proximity of the airport runways.

These type controls like any other land use regulations, are more effective when implemented before significant incompatible development exists in the airport’s vicinity. The compatible land use controls may also be effectively used for mitigating existing incompatible uses. Mitigation of incompatible uses will usually result in both public and private sector costs. The longer the mitigation action is delayed, the greater the eventual cost. Permitting the existence of uses incompatible with the public’s health or safety can result in consequences far greater cost than would its mitigation.

Airports therefore, should be integrated into the total community environment and not considered in isolation of the community in which they are located. Although airports are federally regulated they remain locally sponsored and it is the local sponsor’s responsibility to ensure compatibility within its community.

In administering Title 14 of the Code of Federal Regulations CFR Part 77, the prime objectives of the FAA are to promote air safety and the efficient use of the navigable airspace. To accomplish this mission, aeronautical studies are conducted based on information provided by proponents on an FAA Form 7460-1, Notice of Proposed Construction or Alteration.

This chapter presents elements that should be considered in planning for airport compatibility. Three specific elements are addressed. These include: (1) airspace protection, (2) noise compatibility, and (3) public safety as they relate to zoning of land surrounding the airport's environs.

Generally, these elements can be addressed through overlay zones. Overlay means the areas underneath the zone, have in addition to the land use or comprehensive zoning, an overlay or additional level of controls. Overlay also means the local jurisdiction where the airport is located may have zoning in effect. This means there may be two zoning regulations to be complied with, unless the airport zoning overlay and compatible land use zoning of the jurisdiction are included in one ordinance. **The enclosed CD contains two model airport hazard zoning ordinances** for general aviation airports in Louisiana. Ordinance T1 is for small airplane airports for visual and nonprecision instrument approach procedures and Ordinance T2 is for large airplane airports with visual, non-precision, and precision instrument approach procedures.

## Airport Compatibility Development

Airport compatible land uses are those that are not adversely affected by airport operations or do not adversely affect the use of the airport. Residential development is most sensitive to airport operations and is nearly always incompatible if located close to the airport. Land uses where people congregate such as schools, churches, theaters, and hospitals, also may be incompatible.

Some uses are incompatible because they actually represent a danger to the aircraft using the airport. Examples of these are commercial or industrial activities that generate bright lights at night, smoke or electronic interference with aircraft radio navigation equipment. Landfills which attract large numbers of birds can also be dangerous. The most serious hazards are tall structures that extend into the air around airports where aircraft are operating close to the ground.

Unregulated development and the encroachment of incompatible land uses near airports can create significant public pressure to limit flight operations, prevent or curtail future airport expansion and possibly, in some cases, to close an airport. Three elements must be considered when determining land use compatibility and zoning of land surrounding airports. These include: (1) airspace protection, (2) noise compatibility, and (3) public safety. Each is discussed in the following sections.

## Airspace Protection

Airspace protection is required to preserve and protect public airports as well as the navigable airspace necessary to operate them safely and efficiently. Through regulation of the height of man-made and natural objects, loss of navigable airspace to non-aviation uses, particularly within airport terminal airspace can be limited and controlled. Safety is preserved by preventing objects or structures from becoming hazards to air navigation. A hazard to air navigation jeopardizes the safety of flight activity, aircraft occupants and persons or property on the ground in its vicinity.

Airspace protection can be provided by establishing overlay zoning to limit the height of man-made objects and objects of natural growth. Height limitations do not designate permitted uses in the underlying zoning district, but does designate prohibited uses. For example, an airport zoning ordinance might not prohibit a manufacturing use such as a factory but could limit the height of a water tower associated with the factory.

Height limitations should coincide with the base elevations of navigable airspace. While the height of navigable airspace is objectively definable, the definition can be complex. The height will vary considerably from one location to another. The boundaries and airspace are dependent on multiple site specific variables related to the physical terrain, aviation operations, airport type, runway configuration, air navigation facilities and flight rules.

Generally, the Federal Aviation Administration (FAA) considers the navigable airspace to include all airspace 500 feet or more above the surface and that airspace below 500 feet required for takeoff and landing to include an airport's traffic pattern. Zoning to protect navigable airspace must therefore overlie the area of the adopting jurisdiction. The most restrictive height limitations are necessary in the immediate vicinity of the airport runways and along their extended centerline. In general, required height limitations increase at varying rates as distance from runways increase. Rates vary with functions of several runway factors including type of landing surface, aircraft operating weight category, and instrument landing capability. These variables are described in FAR Part 77 as the imaginary airport surfaces as illustrated in Figures 9.5.

Examples of airport imaginary surfaces at a general aviation airport having visual approaches is illustrated in Figures 9.1-9.4.

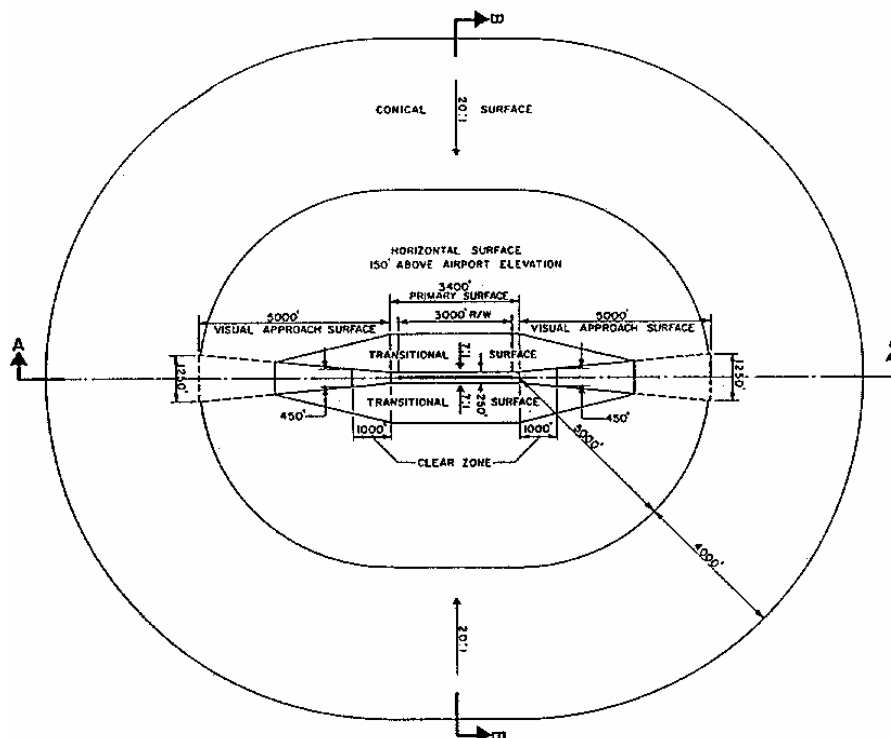


Figure 9.1: Airport Imaginary Surfaces - General aviation Airports (Visual)

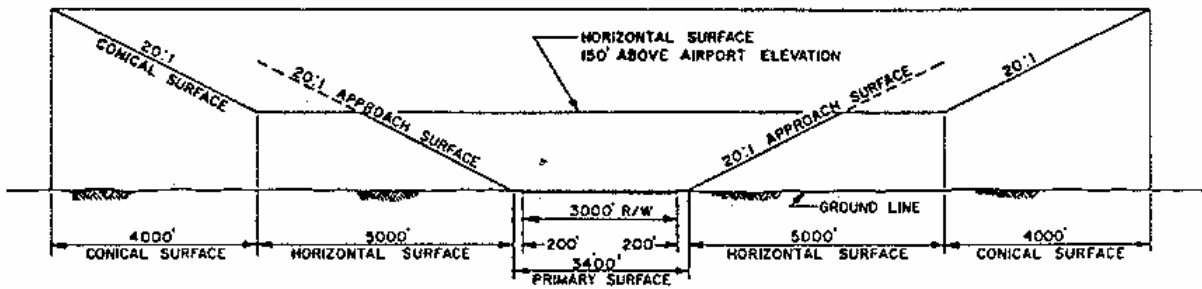


Figure 9.2: Section A - A (See Figure 7.1)

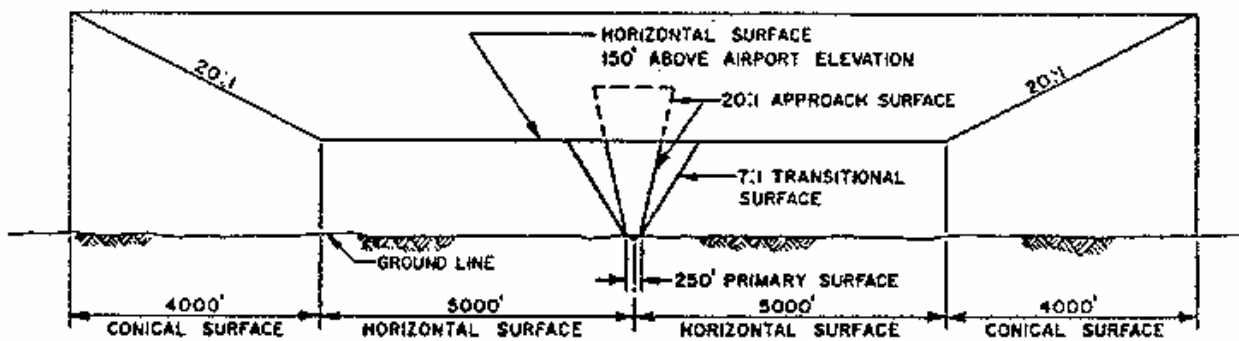


Figure 9.3: Section B - B (See Figure 7.1)

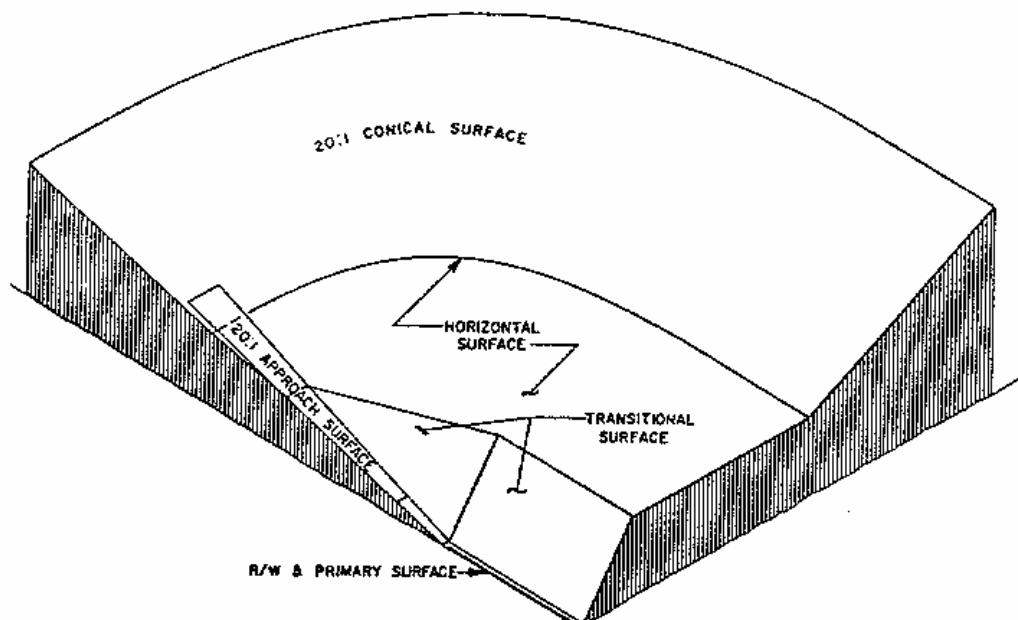


Figure 9.4: Isometric View Showing Imaginary Surfaces - General aviation Airports

### Definition

Obstruction- any object that penetrates an obstruction identification surface (OIS) as defined in Federal Aviation Regulations 14 CFR Part 77. A supplemental obstruction is any object that penetrates an OIS that has been defined as a supplemental OIS by appropriate FAA authorities.

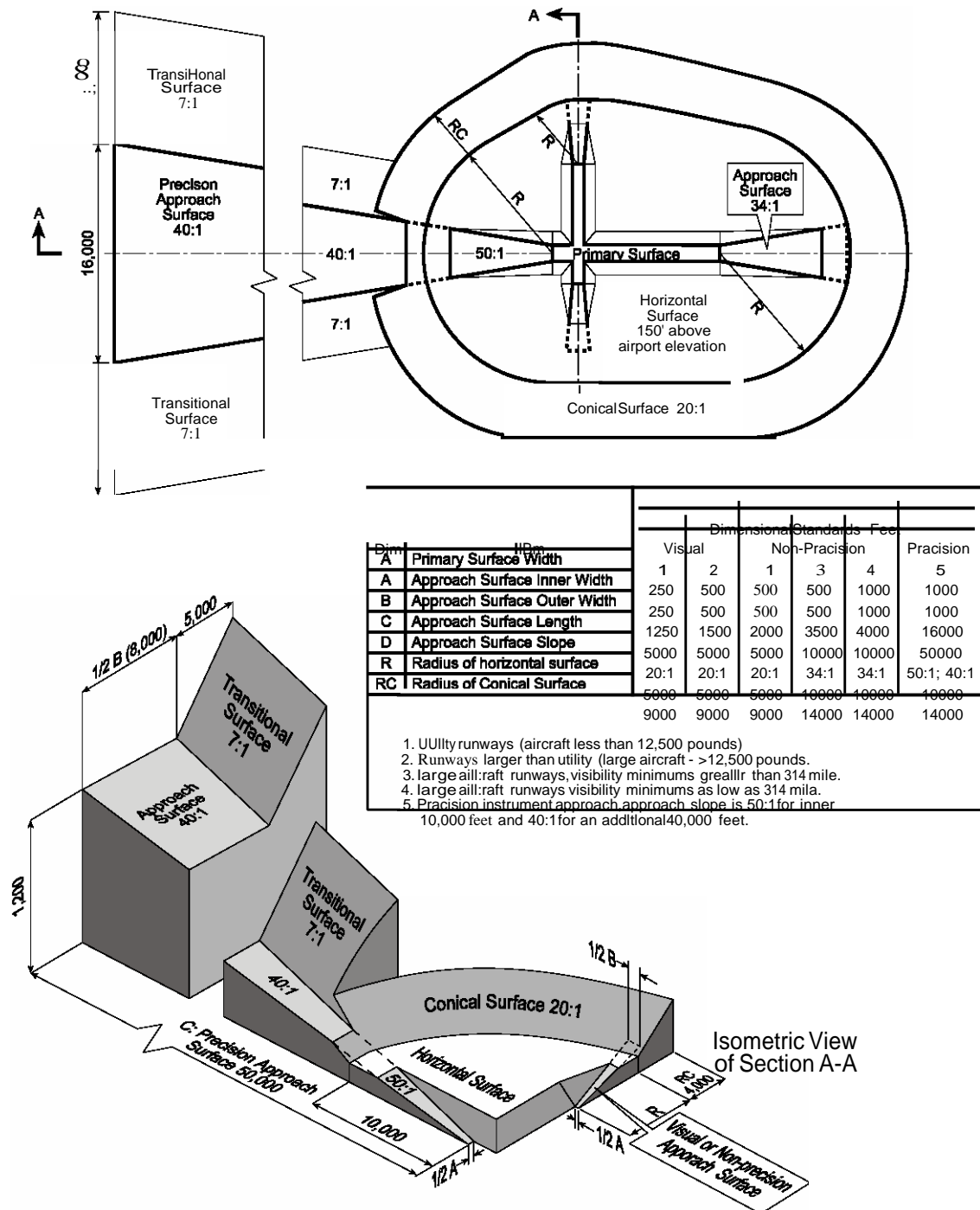


Figure 9.5: Federal Aviation Regulations, Part 77 Imaginary Surfaces

The imaginary airport surfaces provide safety buffers between aircraft arriving and departing at an airport's terminal airspace and objects on the ground. Minimum flight operating heights and procedures are prescribed by federal flight regulations. The difference between normal aircraft operating heights and the obstruction buffers decreases significantly the closer the aircraft is to the runway. The information needed to define the imaginary surfaces for the airport being zoned can be found on the airport layout plan (ALP). The ALP is incorporated in the airport master plan. An ALP is a scaled drawing of existing and planned airport facilities, their locations, and pertinent dimensional information. It also includes a basic data table identifying the airport reference point, airport elevation, existing and planned runways, and existing and planned approaches for the runways. For more information on ALPs, refer to **Chapter 5 - Airport Layout Plans**.

## Noise Compatibility

Noise compatible land use in the vicinity of airports is necessary to protect the public's health and welfare while preserving the airport's capability to efficiently meet aviation transportation needs. Through regulation of noise sensitive land uses, encroachment of incompatible development in the vicinity of airports can be prevented and further development controlled.

Incompatible development, particularly residential development near airports, may cause the airport to decrease, limit or prevent aircraft operations. Incompatible development will adversely impact the airport's capacity improvement plans, particularly runway extensions and/or additions, that are necessary to meet the airport's growth.

Noise compatibility can be established with overlay zoning to control or prohibit noise sensitive land uses or activities in the vicinity of the airport. Noise compatibility controls should address current and future land use within specifically designated zones of airport generated noise exposure. It is accomplished by preventing noise sensitive land uses in those areas where the level of airport sound exposure will adversely impact that land use.

Airport noise exposure maps produced in accordance with 14 CFR FAR Part 150 will provide the best guidance for noise compatibility planning. Appendix A of 14 CFR FAR Part 150 establishes the standards, methods and procedures for producing these maps. Briefly, Part 150 requires airport noise exposure maps be developed using the FAA's Integrated Noise Model (INM).

Noise exposure map development involves airport generated sound based forecast aircraft operations, weighting operations that occur at night and averaging the cumulative output over time. The results are then charted as sound exposure levels on scaled, geographic depictions of the airport and its surrounding areas. Areas within the exposure level contours can then be used to identify incompatible land uses for possible mitigation measures and to establish land use controls that limit future incompatible development. An approved noise exposure map must illustrate those areas surrounding the airport that are 65 LDN (Day-Night Sound Level) and higher exposures. Finally, some airports require a Part 150 element within the Airport's Master Plan.

## Public Safety

The greatest potential risk to public health and safety associated with aircraft operations occurs during take-off and landing. Compatible land use for public safety is required to minimize the risk of injury to the general public in the event of an aviation accident. Controls are also necessary to ensure conditions associated with the land use will not jeopardize the safe operation of aircraft in flight; increase the potential for additional aircraft damage or occupant injury in the event of an aviation accident or interfere with effective emergency response such as an accident.

The public safety element of compatible land use surrounding an airport's environs is provided by establishing overlay zoning to limit certain activities to minimize the risk factors associated with aircraft operations. The potential risk to the public's health and safety is minimized by regulating uses in areas near airports or their runways which can result in the congregation of people, the presence of flammable, explosive or hazardous materials, the presence of intervening structures, objects, excavations or bodies of water in the immediate area of the runways, the emission of smoke, light or other phenomenon that could obscure the pilot's vision during take-off and landing, unshielded electro-magnetic or high energy device emissions that could interfere with ground or airborne electronic systems used for aircraft flight control or navigation, and the attraction of birds or animals in areas where aircraft could strike them during take-off or landing either in flight or on the runway.

## The Airport Zoning Ordinance And Map Process

The steps to be undertaken in drafting and adopting an airport zoning ordinance and map are outlined below:

1. Identify the political subdivision(s) affected by the area to be zoned. This should include all governmental bodies located under all imaginary surfaces of the airport. If the airport to be zoned is located within the territorial limits of the owning political subdivision, that political subdivision may unilaterally zone the airport. If multiple jurisdictions are involved, the airport may want to consider a joint airport zoning board comprised of members of all affected jurisdictions. Such a board will require legal action for its creation. Additionally, an entity that will administer and enforce the ordinance must be created if one does not exist within the local jurisdiction of the airport to be zoned.
2. Develop the zoning ordinance and map addressing airspace protection, noise compatibility, and public safety as described above.
3. Publish a notice to hold a public hearing to receive and accept comments from the general public. The notice should include a description of the purpose of the proposed airport zoning ordinance and include the exact date, time and location of the public hearing. This notice should be published in the local official journal of the jurisdiction and be printed a minimum of three weeks prior to the scheduled public hearing.
4. Hold the first public hearing. At this public hearing a presentation of the recommended zoning ordinance and its purpose should be made to the attending public. Public



comment should then be received and recorded for the purpose of incorporating all comments and to address concerns where applicable.

5. Revise the proposed airport zoning ordinance and map to reflect the public input received during the first public meeting.
6. Publish a notice of the second public hearing.
7. Hold second public hearing presenting the final zoning ordinance and map as it reflects comments and revisions accepted at the first public hearing.
8. Adopt the airport zoning ordinance and have it certified by the appropriate city or parish attorney.

The above steps are for consideration by parishes and municipalities in which zoning ordinances do not exist. In those locations where zoning ordinances do exist and are adopted by the local jurisdiction, the airport zoning ordinance should become a part of the local jurisdiction's ordinance. **The enclosed CD** contains two model airport hazard zoning ordinances for general aviation airports in Louisiana.

In administering Title 14 of the Code of Federal Regulations CFR [Part 77](#), the prime objectives of the FAA are to promote air safety and the efficient use of the navigable airspace. To accomplish this mission, aeronautical studies are conducted based on information provided by proponents on an FAA Form 7460-1, Notice of Proposed Construction or Alteration.

## References

Louisiana Law Revised Statutes 33:4721-4732

Federal Aviation Regulation Part 77, "Objects Affecting Navigable Airspace"

Federal Aviation Administration Advisory Circular 70/7460-1K, "Obstruction Marking and Lighting"

Federal Aviation Administration Advisory Circular 70/7460-2K "Obstruction Marking and Lighting"

Federal Aviation Administration Advisory Circular 150/5020-1, "Noise Control and Compatibility Planning for Airports"

Federal Aviation Administration Advisory Circular 150/5070-6B, "Airport Master Plans"

Federal Aviation Administration Advisory Circular 150/5070-7, "The Airport System Planning Process"

Federal Aviation Administration Advisory Circular 150/5190-4A, "A Model Zoning Ordinance to Limit Height of Objects Around Airports"

Federal Aviation Administration Advisory Circular 150/5200-32A, "Reporting Wildlife Aircraft Strikes"

Federal Aviation Administration Advisory Circular 150/5200-33A, "Hazardous Wildlife Attractions on or near Airports"

Federal Aviation Administration Advisory Circular 150/5200-34A, “Construction or Establishment of Landfills Near Public Airports”

Federal Aviation Administration Advisory Circular 150/5300-13, “Airport Design”

Federal Aviation Administration Advisory Circular 150/5300-16, “General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-17, “General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-18, “General Guidance and Specifications for Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards”

Federal Aviation Administration Advisory Circular 150/5320-14, “Airport Landscaping for Noise Control Purposes”

# Chapter 10 - Airspace Obstructions

## Introduction

An airspace obstruction can be an object created by man, whether existing or planned, permanent or temporary, and can also be natural growth on terrain. Obstructions to air navigation are presumed to be hazards to air navigation until a Federal Aviation Administration (FAA) study determines otherwise. **The airport sponsor or applicant requesting a study has the burden of proving the object is not a hazard.** Federal Aviation Regulation (FAR) Part 77, states that an object is an obstruction if it is higher than any of the following:

- A height of 500 feet above ground level at the site of the object.
- A height of 200 feet above ground level or above the established airport elevation, whichever is higher; within 3 nautical miles of the established airport reference point (mathematically calculated center of the airport), excluding heliports, with its longest runway more than 3,200 feet in actual length. That height increases 100 feet for each *additional* nautical mile of distance from the airport up to a maximum of 500 feet.
- A height that is within the terminal obstacle clearance area which results in the vertical distance between any point on that object, and an established minimum instrument flight altitude within that area, being less than what is the required obstacle clearance.
- A height within an en route obstacle clearance area of a Federal airway or approved airway route, which would make the minimum obstacle clearance altitude increase.
- A height that would penetrate any imaginary surfaces associated with a public use airport (civil airport), military airport or heliport.

Obstructions and airport imaginary surfaces are detailed, defined and discussed in FAR Part 77, "Objects Effecting Navigable Airspace."

## Notice Of Construction Or Alteration

In administering FAR Part 77, the prime objective of the FAA is to ensure the safety of aircraft and the efficient use of navigable airspace by aircraft. The FAA recognizes that there are varied demands for the use of airspace, both by aviation and non-aviation interests. When conflicts arise out of construction proposals, the FAA emphasizes the need for conserving the navigable airspace.

Early notice of proposed construction or alteration provides the FAA the opportunity to:

- Evaluate the effect of the construction or alteration on operational procedures and proposed operational procedures.
- Determine if the proposed construction or alteration has any possibly hazardous effects on air navigation.
- Give recommendations for marking and lighting the construction or alteration in accordance with all FAA regulations.
- To update charting and other Notifications To Airmen of the construction or alteration.
- To determine any other appropriate measures to be instituted for continued safety of air navigation.

## Construction Or Alteration Requiring Notices (FAA Form 7460-1)

All projects involving construction on or near airports, are required to submit the **FAA Form 7460-1, "Notice of Proposed Construction or Alteration"**, located **on the enclosed CD**, to the FAA Regional Air Traffic Division if the proposed construction or alteration falls into any of the following categories:

1. As a general rule, any activity on an airport should be submitted, as well as any crane or tower work in the vicinity of an airport.
2. The proposed construction or alteration would be more than 200 feet in height above ground level at its site near an airport.
3. Located on any of the following airports (including heliports):
  - A public use airport that is listed in the Airport Directory of the current Airman's Information Manual.
  - An airport under construction, that is planned or proposed and that will be available for public use.
  - An airport that is operated by any armed forces of the United States.
4. When any construction or alteration is within 20,000 feet of the airport reference point of an airport (as described above in number 3) that has at least one runway longer than 3,200 feet. The object would be higher than a 100:1 horizontal slope (meaning 100 feet horizontally for each 1 foot vertically) approach zone from the nearest point, of the nearest runway, excluding heliports.

5. When any construction or alteration is within 10,000 feet of the reference point of an airport (as described previously in number 3) not having any runway more than 3,200 feet in length and the object would be higher than a 50:1 horizontal slope (meaning 50 feet horizontally for each 1 foot vertically) approach zone from the nearest point of the nearest runway, excluding heliports.
6. When any construction or alteration is within 5,000 feet of the reference point of a heliport (as described previously in number 3), and the object is higher than a 25:1 horizontal slope (meaning 25 feet horizontally for each 1 foot vertically) approach zone from the nearest landing and takeoff area of that heliport.
7. When there is proposed construction or alteration to any of the following:
  - Any interstate highway, including the imaginary space that extends 17 feet above that highway (to allow for the height of any moving vehicles or other objects), which would make the highway and its imaginary space penetrate the approach zones described above (numbers 1-6).
  - Any other public roadway, including the imaginary space that extends 15 feet above that roadway (to allow for the height of any moving vehicles or other objects), which would make the public roadway and its imaginary space penetrate the approach zones described above (numbers 1-6).
  - Any private road, including the imaginary space that extends 10 feet above that roadway or the height of the highest mobile object that would normally cross the roadway, which would make the private road and its imaginary space penetrate the approach zones described above (numbers 1-6).
  - Any railroad, waterway, or any other thoroughfare not mentioned, including the imaginary space that extends 23 feet above those thoroughfares or the height of the highest mobile object that would normally cross them, which would make these thoroughfares and their imaginary spaces penetrate the approach zones described above (numbers 1-6).

The LA DOTD Aviation Section has sponsored a program called the Photoslope process where designated runway approach surfaces are photographed in order to identify objects which penetrate these approach surfaces as defined by FAR Part 77. Through the use of these photographs, the Photoslope process documents the status of runway approach surfaces. The format of the photography allows the airport manager and state and federal inspectors to visualize the approach, identify existing obstructions, and anticipate potential obstructions.

All photographic documentation can be stored for immediate access through a PC based computer system (IBM Compatible). If you want more information about the Photoslope program, contact the Division of Aviation.

## Construction Or Alteration Not Requiring Notice

The sponsor is not required to notify the FAA for any of the following construction or alteration:

- Any object that would be shielded by any permanent existing structures or by any natural terrain that is of equal or greater height.
- Any antenna structure 20 feet or less in height except if it increases the height of another antenna structure.
- Any FAA approved air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device that has a fixed location and height.
- Any construction or alteration for which notification is required by any other FAA regulation.

## Filing Notices

Each sponsor who proposes construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously) shall send one executed set (four copies) of the FAA Form 7460-1, "Notice of Proposed Construction or Alteration" to the following address:

**DOT/FAA**  
**Airports Division, ASW-640**  
**Fort Worth, Texas 76193-0640**  
**Tel: (817) 222-5640 Fax: (817) 222-5988**  
**<http://www.faa.gov/arp/asw>**

A copy must also be sent to the LADOTD, Division of Aviation at the following address:

**LADOTD**  
**Division of Aviation**  
**P. O. Box 94245**  
**Baton Rouge, Louisiana 70804-9245**  
**Tel: (225) 274-4125 Fax: (225) 274-4181**  
**[http://www.dotd.louisiana.gov/section\\_home.asp?SEC=88](http://www.dotd.louisiana.gov/section_home.asp?SEC=88)**

This notice must be submitted at least 30 days prior to the date of construction or alteration, or 30 days prior to the date the construction permit is applied for, whichever is sooner. The application is usually filed by the owner of the object that will undergo the construction or alteration.

If the project is subject to Federal Communications Commission (FCC) licensing requirements such as constructing or altering communication towers, the FAA must be notified on or before the date of filing with the FCC. In the case of an emergency involving essential public services, where public safety or health is a concern, telephone notification is acceptable if the FAA is also notified in writing within 5 days.

Any proposed structure or alteration to an existing structure that is higher than 2,000 feet above the ground will be presumed to be a hazard to air navigation and results in inefficient use of airspace, unless proven otherwise by the sponsor.

## **Additional Notices**

Each sponsor who *proposes* construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously) may be notified by the FAA that a supplemental notice is required. In this case, the sponsor must submit a FAA Form 117-1, “Notice of Progress of Construction or Alteration”, to the FAA regional office at least 48 hours prior to the start of the construction or alteration.

Also, each sponsor who *begins* construction or alteration that is the subject of a notice (FAA Form 7460-1 as described previously), must submit a FAA Form 117-1 to the FAA regional office within 5 days after the construction or alteration reaches its greatest height if the construction or alteration is more than 200 feet in height above ground level at its site, or if the FAA states that the submission of this form is required.

## **Acknowledgment Of Notices**

The FAA will return, in writing, an acknowledgment stating they have received the FAA Form 7460-1. The FAA will indicate that the construction or alteration proposed either: would not exceed any standard previously described and would not be an obstruction to air navigation; would exceed a standard described previously but would not be a hazard to air navigation; or would exceed a standard described previously and further study is necessary to determine if it would be a hazard to air navigation. Until any further study has been completed, the proposed construction or alteration would be presumed to be a hazard to air navigation.

The FAA may sometimes request a complete airspace study. This airspace study mainly consists of comments from all applicable governing agencies, including local, state and federal agencies.

Once complete, a “Determination of Hazard to Air Navigation” or a “Determination of No Hazard to Air Navigation” is issued. Structures that receive the “hazard” designation may still be constructed unless the structure needs licensing or permitting from the FCC. The FCC will not issue permits and licenses to owners of structures deemed by the FAA as being “hazards to air navigation.”

**Persons failing to comply with the provisions of FAR Part 77 may be subject to a criminal penalty under Section 902 of the Federal Aviation Act of 1958, as amended.**

## Obstruction Marking And Lighting

The FAA may recommend that a structure be marked and/or lighted to warn pilots. The following sections discuss some aspects of marking and lighting objects. For all marking and lighting standards, please refer to the FAA Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting" for additional information.

### Marking

Marking structures is used to identify obstacles during daylight hours in order to warn pilots of the obstructions. This is accomplished by painting the structure or by using suitable markers. Two colors of paint are used in marking: orange (Aviation Orange Federal Standard Number 12197) and white (Aviation White Federal Standard Number 17875). These colors should conform to the Federal Standard FED-STD-595 for chromaticity and luminance. With the heat and rain conditions that are prevalent in Louisiana, all structures should be repainted when showing signs of deterioration, usually often.

Various types of paint patterns are used to mark structures. The pattern used depends upon the size and shape of the structure. The different types of paint patterns are illustrated in **Figure 10.1** and are described below:

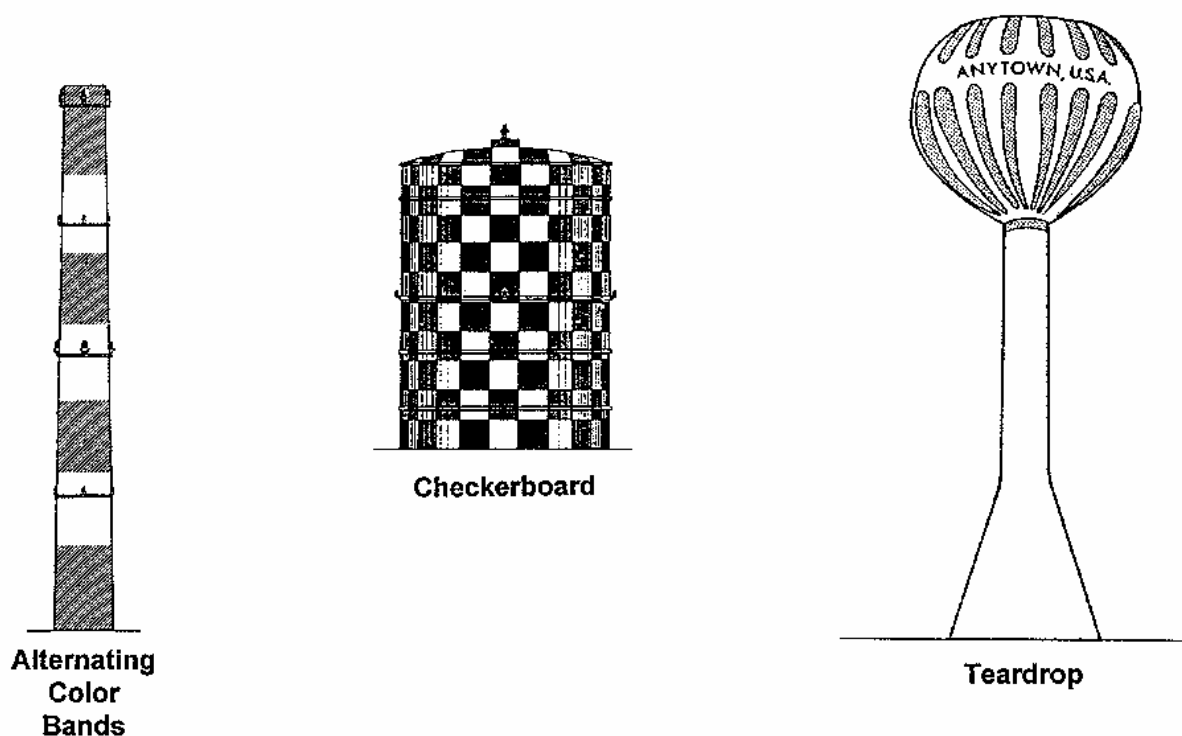
Solid Pattern: Structures that have both horizontal and vertical dimensions that are less than 10.5 feet should be colored a solid aviation orange.

Checkerboard Pattern: Large structures that are more than 10.5 feet across and have a horizontal dimension that is equal to or greater than the vertical dimension (such as storage tanks), should be colored with alternating rectangles of aviation orange and aviation white. The sides of the checkerboard rectangles should measure not less than 5 feet or more than 20 feet. For more information and for some exceptions, please refer to the standards established in AC 70/7460-1G "Obstruction Marking and Lighting".

Alternating Color Bands: Large structures that are more than 10.5 feet or more across and have the vertical dimension that is larger than the horizontal dimension (such as communication towers, smokestacks, poles, skeletal framework of storage tanks, etc.), should be marked with alternating bands of aviation orange and aviation white. The width of the bands will depend upon the width and height of the structure. For more information please refer to the standards established in Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting".



**Teardrop Pattern:** Circular shaped water storage tanks that have a single circular standpipe support may be marked in teardrop striped pattern. The tank should be colored to show alternating stripes of aviation orange and aviation white. The stripes should extend from the top center of the tank to its supporting standpipe. The width of the stripes should be equal and the width of each stripe at the greatest girth of the tank should not be less than 5 feet nor more than 15 feet.



**Figure 10.1: Various Structure Marking Patterns**

Markers should be used when painting an object is not practical. Ball markers are usually used on overhead lines. All ball markers should not be less than 36 inches in diameter when these lines cross long distances, such as over rivers. Small 20-inch diameter ball markers may be used on lines that cover shorter distances, that are below 50 feet above the ground or are within 1,500 feet of the runway end. Depending on the length, these ball markers should be spaced equally across these lines but not exceeding 200 feet apart. Alternating colors of aviation orange, white, and yellow should be used to provide the greatest visibility of these ball markers. When less than four balls are used, they should all be aviation orange.

Flag markers may be used to mark certain obstructions when painting or ball markers are technically impractical. Temporary construction equipment, cranes, derricks, oil drilling rigs are some examples. The flags should be placed at the highest point of a structure. An aviation orange flag of not less than 2 feet square is recommended but, a checkerboard pattern of aviation orange and aviation white is also frequently used. Flag stiffeners should be used to keep it from drooping in calm wind.

## Lighting

Lighting structures is a method used to identify obstacles at night in order to warn pilots of the obstructions.

Obstruction lighting may be displayed in any of the following combinations:

Aviation Red Obstruction Lights: This method is the minimum lighting system which uses flashing aviation red beacons and steady burning aviation red lights during the nighttime. Aviation orange and aviation white paint should be used for daytime marking.

High Intensity White Obstruction: This method uses flashing high intensity white obstruction lights during the daytime and automatically reduced intensity for twilight and nighttime operation. An FAA aeronautical study will be conducted to determine if this system is recommended to make the structure more visible. When this type of system is used, other methods of marking and lighting the structure may be omitted. This system is not recommended on structures 500 feet tall or less unless an FAA aeronautical study shows otherwise.

Medium Intensity White Obstruction Lights: During daytime medium intensity white obstruction lights with control for intensity change for darkness may be used. When this type of system is used on structures 500 feet tall or less, other methods of marking and lighting the structure may be omitted. Aviation orange and aviation white paint should be used for daytime marking on structures over 500 feet tall. This system should not be used on structures less than 200 feet in height unless an FAA aeronautical study shows otherwise.

For more information on obstruction lighting standards and other combinations of lighting systems, please refer to the standards established in Advisory Circular AC 70/7460-1G "Obstruction Marking and Lighting".

## Terminal Instrument Procedures (TERPs)

The United States Standard for Terminal Instrument Procedures (TERPs) contains criteria which are used to establish procedures for instrument approaches and departures of aircraft to and from civil and military airports. These criteria are to be used at any airport where an appropriate United States Agency exercises jurisdiction.

The FAA establishes and approves terminal instrument procedures for civil airports. At civil airports, the owner/operator can make request to the FAA for procedures. The FAA will grant requests for an instrument approach procedure and/or instrument departure procedure if the following minimum standards are met:

### *Airport*

- Runways must have adequate landing surfaces for the expected aircraft using the procedures.
- These runways must be marked and lighted as specified in the FAA's "United States Standard for Terminal Instrument Procedures".
- The airport must pass an FAA airport airspace analysis conducted in accordance with the FAA Handbook 7400.2B "Procedures for Handling Airspace Matters".

### *Navigational Facility*

- All electronic and visual navigation facilities used must successfully pass flight inspection.

### *Obstacle Marking and Lighting*

- Obstacles which penetrate FAR Part 77 imaginary surfaces should be marked and lighted in accordance with the FAA Advisory Circular AC 70/7460.1G "Obstruction Marking and Lighting".

### *Weather Information*

- Terminal weather observation and reporting facilities must be available for the airport to serve information on an alternate airport.

### *Communications*

- Air-to-ground communications must be available at the initial approach fix minimum altitude and when the aircraft performing the missed approach reaches the missed approach altitude. At lower altitudes communications shall be required wherever it is essential to the safe and efficient use of the airspace.

For more information on TERPs and the requirements to establish them, please refer to the Federal Aviation Administration's "United States Standard for Terminal Instrument Procedures".

## References

Federal Aviation Administration, "United States Standard for Terminal Instrument Procedures".

Federal Aviation Regulation Part 77, "Objects Affecting Navigable Airspace"

Federal Aviation Administration Advisory Circular 70/7460-1K, “Obstruction Marking and Lighting”

Federal Aviation Administration Advisory Circular 70/7460-2K “Obstruction Marking and Lighting”

Federal Aviation Administration Advisory Circular 150/5020-1, “Noise Control and Compatibility Planning for Airports”

Federal Aviation Administration Advisory Circular 150/5050-4, “Citizen Participation in Airport Planning”

Federal Aviation Administration Advisory Circular 150/5070-6B, “Airport Master Plans”

Federal Aviation Administration Advisory Circular 150/5070-7, “The Airport System Planning Process”

Federal Aviation Administration Advisory Circular 150/5190-4A, “A Model Zoning Ordinance to Limit Height of Objects Around Airports”

Federal Aviation Administration Advisory Circular 150/5200-32A, “Reporting Wildlife Aircraft Strikes”

Federal Aviation Administration Advisory Circular 150/5200-33A, “Hazardous Wildlife Attractions on or near Airports”

Federal Aviation Administration Advisory Circular 150/5200-34A, “Construction or Establishment of Landfills Near Public Airports”

Federal Aviation Administration Advisory Circular 150/5300-13, “Airport Design”

Federal Aviation Administration Advisory Circular 150/5300-16, “General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-17, “General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey”

Federal Aviation Administration Advisory Circular 150/5300-18, “General Guidance and Specifications for Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards”

Federal Aviation Administration Advisory Circular 150/5320-14, “Airport Landscaping for Noise Control Purposes”

# Chapter 11 - Vegetation Management

## Introduction

The important point to remember in managing vegetation on airports is that the primary purpose of grass on airports is to prevent wind and water erosion, and to reduce dust. The airport manager should have some knowledge of plants, ways to control weeds and the proper use of herbicides in order to control problem plants on the airport. This chapter will provide various aspects of information on managing vegetation on an airport, such as the various areas of an airport in need of weed control, the safety precautions needed for herbicide use, and also information on problem weeds and their suggested controls.

## Managing Turf Areas

A good turf is maintained by frequent watering, fertilizing, re-seeding, and intelligent mowing. Using enough fertilizer and heavy seeding is recommended for a vigorous and fast growth. Unless grass is cut at regular intervals, weed growth increases to such an extent that eventually even the most hardy grasses will be crowded or choked out. Frequent cutting develops a thick and dense turf which is essential on an airfield to keep dust down, cover loose particles of sand and gravel, absorb rainfall more readily, and aid in the prevention of erosion.

The first step in defining a turf-growing plan is to notice that different areas of the airport will require different treatment. Seeding will be satisfactory for general areas that are level, but sod will be better for ditches, drainage areas, and new construction. Fertilizer will be a necessity in some sections of the airport and/or for some soils, but only a convenience in other areas.

## Seeding

Before planting, the soil should be prepared to support the growth of a thick healthy turf. Lime usually promotes plant growth and should be added before the soil is worked, if the soil is lacking in lime. A good commercial fertilizer will help the grass to grow vigorously, decrease weed growth, and form a dense sod. After the soil is well-worked, the seed is sown. For grass legume mixtures, 60 to 90 pounds of seed per 1.5 acres; for grasses like rye grass, 70 pounds; and for small grasses like red top and timothy, 20 to 30 pounds usually make a good cover. The rate of seeding should be materially reduced in dry areas. Seed should be planted only 1/8 or 1/4 inch deep. A grass drill, grain drill with grass-seed attachment, or a wheelbarrow type broadcast seeder is needed for large areas. If the broadcast seeder is used, the seed should be covered by means of a cultipacker or a spiked-tooth harrow.

Small areas can be planted with a hand-operated whirlwind seeder if the seed is to be covered by means of a corrugated or perforated roller. Caution must be exercised, as a heavy roller or an overrolled area may pack the surface and form a crust through which seed cannot grow. On poor soils, slopes, and eroded areas, a very light mulch of straw, hay, or manure should be added immediately after seeding for protection. Heavy jute mesh may also be used to stabilize newly graded ditches or slopes, preventing erosion until vegetation becomes established.

Temperature and rainfall are the major factors which determine choice of any grass. Any of the species recommended for non-irrigated areas may be replaced with a species adapted to more humid regions providing it is in the correct temperature group. A few of the grass species adapted for airports in various regions are listed below:

TEMPERATURE GROUP	HUMID OR IRRIGATED	SUB-HUMID OR NON-IRRIGATED
Warm Season	Bahiagrass	Bermuda
	Bermuda	Gramagrasses
	Carpetgrass	Little bluestem
	Centipede	Sand dropseed
	Dallisgrass	Weeping lovegrass
	Zoysia	
Cool Season	Chewings fescue	Bromegrass
	Crested wheatgrass	Crested wheatgrass
	Kentucky bluegrass	Tall oatgrass
	Red fescue	Western wheatgrass
	Tall fescue	

If you start a turf from seed on a new airport, or on a new construction area, a minimum of two growing seasons following the original seeding will be required to obtain an adequate foundation turf--one that will provide protection for the soil and be free of eroded or killed spots. And until the turf is well established, newly graded areas will be very susceptible to erosion.

## Sodding

Sodding requires more labor than seeding, but may be necessary on such critical areas as drainage outlets or steep slopes. Sod strips should be laid along the contour lines of the slope, fitted snugly together, rolled to remove all air pockets, and watered frequently. The joints on alternate strips should be staggered and all holes filled with good soil. The lowest strip, or alternate strips on some slopes, may have to be pegged to hold the sod in place. A sod cutter is necessary, but no other special equipment is needed except tamping tools. Take sod 1-1/2 to 2 inches thick from pastures or other areas then roll it up and lay it at once to prevent drying or heating. Cut sod just thick enough to hold together during rolling and unrolling. A thin sod starts more quickly and less material has to be moved to cover the same amount of area.

For broadcast sodding with rootstalk grasses such as Bermuda or Kikuyu, tear up sod to be moved with a disk harrow. Lift sod with power shovels or draglines into dump trucks. Scatter it in the area and level with a grader without attempting to preserve the sod.

## Weed Control

Weed control can sometimes be a serious problem. However, a weed cover may prevent dust and erosion and help in establishing a stand of permanent grass in light rainfall areas.

Weeds should not be permitted to spread, but complete elimination of nonpoisonous species is rarely necessary. Weeds can be classified as either annuals, with roots living but one year, and biennials or perennial, with roots living 2 or more years. Noxious weeds are usually creeping perennials which usually spread from roots or seed and are extremely difficult to kill.

Birds have an instinctual need to see other birds while they are feeding, therefore birds tend to be attracted to areas of low cut grass. Since some weeds produce seeds that attract insects, which in turn attract birds, it is important to keep all turf areas free of weeds. Therefore, maintaining a turf area that is between 7 inches to 14 inches high, is an effective method in discouraging the attraction of large and small flocking birds. Most annuals and a few perennial can be killed by mowing just as the blossoms begin to open. Because various weeds blossom at different seasons, mowing at least twice a year is usually necessary.

Although weed-killing chemicals are expensive and may be dangerous, they are useful on small areas for killing individual plants or groups of plants, or for keeping down all vegetation adjacent to runways, taxiways or aprons. Ammonium sulfamate, sodium chlorate, and sodium arsenate are among the chemicals generally used.

### **Runways, Taxiways and Other Paved Surfaces**

Applying herbicide prior to paving will prevent growth if the base material is known or suspected to contain seeds or other plant parts. Apply the herbicide after the base is compacted and just prior to applying the prime coat. Either granules or sprays can be used, but sufficient water must be applied to dissolve the granules.

### **Pavement Edge**

The most common cause of damage to pavement edges, as well as the pavement itself, occurs when uncontrolled vegetation grows onto and into the soil/pavement intersection. Most airport vegetation management personnel prefer to maintain a narrow band of exposed soil, free of vegetation outside the pavement edge. Treatment of the soil prior to paving does not prevent the vegetation from entering the pavement edge from outside the pavement. Weeds should not be allowed to obstruct views of any runway and taxiway edge lighting systems. Also, weeds and grass along the pavement edges should be cut at regular intervals to allow for proper drainage.

**Runway Shoulder**

Grassed runway shoulders can be maintained by mowing. If weeds intrude this area, then they should be treated. As stated earlier, no weeds or grass should be allowed to obstruct views of any runway and taxiway edge lighting systems. Also, keep a well manicured runway shoulder to allow for proper drainage.

**Lights**

All grass and/or weeds surrounding navigational aids and lighting fixtures, should be maintained as frequently as possible. In no way should by overgrown turf or weeds obstruct views of these lights.

**Outfield**

The outfield is usually mowed. Treatment chemicals are available to reduce the amount of mowing needed in these areas.

**Drainage Ditches**

Controlling weeds and brush along ditches makes these ditches more efficient. Weeds and brush can decrease the flow capacity of a ditch by as much as 30%, which in turn can cause flooding to neighboring areas of an airport, producing a safety hazard along with causing significant property damage.

Controlling these weeds and brushes through a herbicide vegetation management program provides an easier long-term solution for controlling the weed problem.

## Controls For Specific Persistent Weeds

Plants that are undesirable to any operation are called "weeds". The backbone of any vegetation management operation is plant identification.

**Bermuda Grass**

Bermuda grass is an aggressive, warm-season grass and grows in all regions of Louisiana. It can grow through or intrude from outside an asphalt pavement. Seeds lodging in cracks or joints of asphalt or concrete sprout and form new plants. Some recommended controls can be found below.

<b>FORMULATED HERBICIDE CONTROLS</b>	<b>SPRAY VOLUME</b>
<i>Roundup</i> applied at 5 quarts per acre (3 ounces per gallon of water per 1000 square feet)	10 - 40 gallons of water per acre
<i>Dowpon</i> applied at 5 to 10 pounds per acre plus 1/4% surfactant	25 to 50 gallons of water per acre plus 1 quart of surfactant per 50 gallons of water



*Dowpon* should be applied when the grass is 4" to 6" tall and actively growing. Delay disturbing the area for at least three (3) days.

### **Johnson Grass**

Johnson grass is an aggressive, active weed that spreads by seeds and by extending its root structure.

Some recommended controls for Johnson grass can be found below.

FORMULATED HERBICIDE CONTROLS	SPRAY VOLUME
<i>Dowpon</i> applied at 5 to 10 pounds per acre plus 1/2% surfactant	50 to 100 gallons of water per acre plus 1 quart of surfactant per 50 gallons of water
<i>DSMA</i> ( <i>disodium methanearsonate</i> ) applied at 6.0 pounds per acre or <i>MSMA</i> applied at 4.0 pounds per acre plus 1/2% surfactant	50 to 100 gallons of water per acre plus 1 quart of surfactant per 50 gallons of water
<i>Roundup</i>	2 to 3 quarts per acre

Apply *Dowpon* when the grass is 8" to 16" tall and actively growing. Delay disturbing the area for at least three (3) days. Apply *DSMA* or *MSMA* (*monosodium acid methanearsonate*) when air temperature is 70° F or above for best results. Use this treatment when the grass is actively growing and retreat the area as needed. *Roundup* should be used on sites where non-selective weed control is needed.

### **Nutsedge**

Some recommended controls for Nutsedge can be found below.

FORMULATED HERBICIDE CONTROLS	SPRAY VOLUME
<i>Eptam 6E</i> at 1 gallon per acre	20 to 40 gallons of water per acre
<i>Roundup</i> applied at 2 to 3 quarts per acre	10 to 40 gallons of water per acre

Apply *Eptam 6E* after existing stands of Nutsedge have been destroyed. Mix into the soil 4" to 6" deep immediately after application. This technique should contain the Nutsedge for two to three months.

## **Vegetation Control For Asphalt Pavements**

When trying to control vegetation prior to installing asphalt pavements or controlling weeds in existing asphalt pavements, application of herbicide becomes an effective control method. However, vegetation such as trees and shrubs may be damaged or even killed if their roots grow into an area of herbicide treated soil.

Some suggested herbicides and application methods for vegetation control under asphalt pavements can be found in **Table 11.1**.

**Table 11.1: Suggested Herbicide Application Methods For Vegetation Control Under Asphalt Pavement**

TYPE AND RATE OF HERBICIDE	TIME TO APPLY	WEEDS CONTROLLED	REMARKS
<i>Borascu</i> at 4,840 lbs. per acre	Apply just ahead of prime coat.	All weeds controlled.	Apply dry. Mix into the soil to 4" depth. Thorough mixing is needed for proper bonding of asphalt to base material.
<i>CBM</i> (Sodium chlorate plus sodium metaborate) at 240 gallons per acre.	Apply just ahead of prime coat in 200 gallons of water per acre.	All weeds controlled.	Weeds from adjacent areas may grow under edge of pavement.
<i>Hyvar XL</i> at 12 gallons per acre or <i>Hyvar X</i> at 30 lbs. per acre.	After shaping and prior to compacting.	All grasses, sedges and broadleaf weeds.	After spraying, mix into the top 6" of material with rotary equipment.
<i>Pramitol 25E</i> at 25 gallons per acre or <i>Pramitol 80 WP</i> at 60 lbs. per acre.	Same as above.	Same as above.	Same as above. Do not apply <i>Pramitol</i> under asphalt coating less than 3" thick.
<i>Treflan</i> at 3.0-4.0 gallons per acre.	Same as above.	Grasses and some broadleaf weeds.	Use sufficient water to insure thorough wetting of soil.
<i>Spike 80W</i> at 5.0-20.0 lbs. per acre.	Same as above.	Broadleaf weeds and grasses.	Rate depends on weeds to be controlled. See label.

Some suggested herbicides and application methods for vegetation control in existing asphalt pavements can be found in **Table 11.2** below.

**Table 11.2: Suggested Herbicide Application Method For Vegetation Control In Existing Asphalt Pavement**

TYPE AND RATE OF HERBICIDE	SPRAY VOLUME	WEEDS CONTROLLED	REMARKS
<i>Roundup</i> at 5 quarts per acre.	Apply in 10-40 gallons of water.	Broadleaf weeds and grasses.	Annual weeds; 2 ounces per gallon of water per 1000 square feet. Bermudagrass, Nutsedge, and other perennial weeds; <u>3 ounces per gallon of water per 1000 sq. feet.</u>

Other treatments used for soil sterilization can also be used to treat the soil under the pavement. *Hyvar* is more effective in controlling Nutsedge than many of the other herbicides listed. All of the soil sterilization treatments may injure vegetation some distance from the edge of the pavement. *Hyvar*, *Karmex*, *Aatrex*, and *Pramitol* may injure trees adjacent to the treated area.

## Herbicide Use

Herbicides can aid an airport manager in controlling vegetation in large areas such as exists on airports. The airport manager should have some knowledge of the different types of uses, effects, and application methods in order to choose a method that is both effective and environmentally sound to animals and humans.

If herbicides are handled or applied improperly, or if unused portions are not disposed of safely, they may be injurious to humans, domestic animals, desirable plants, fish and other wildlife, and contaminate water supplies. Use herbicides only when needed and handle them with care. Follow the directions and heed all precautions on the container labels.

As with any chemical, all containers of herbicides should properly labeled to avoid misuse. When label instructions and proper application techniques are used, herbicides should perform as expected and present no undue hazard.

In case of an accidental spill, contact the manufacturer or the Louisiana Department of Agriculture and Forestry and the Department of Environmental Quality (DEQ) for instructions. For information on purchasing herbicide through state contracts, please contact the nearest Department of Agriculture Louisiana Cooperative Extension Service office from the listing provided at the end of this chapter.

## Broadcast Spraying

Most airports, because they have such large areas to treat, use some type of broad spraying techniques. This may be accomplished by equipping mowing vehicles with containers and sprayers able and approved to store herbicides.

When using this spraying technique, all areas under the applicator or spray nozzles will be affected. Many vehicles are equipped with booms containing multiple spray nozzles to cover the most area at a given time. Flat spray nozzles are the most common used. These types of nozzles come in various angle patterns to give the user the most accurate spray coverage.

Setting these nozzles in a uniform fashion along a boom setup and making sure they are at the appropriate height, will greatly reduce overlap or spraying zones. However, a certain amount of spray overlap is recommended to assure areas will not be missed. There are some spray nozzles designed to spray wider angles, yet they are not as accurate and more susceptible to wind conditions because of their large spray area.

All personnel who use herbicides should be trained and made aware of the potential hazards they can create if used improperly. Individuals should never mix herbicides, or any other chemical

for that matter, alone. Each herbicide container is properly labeled with care instructions, handling instructions and personal protection instructions. Have all personnel; who use these herbicides regularly read these instructions carefully and be thoroughly familiar with them.

The Louisiana Department of Agriculture and Forestry periodically provides seminars and training sessions in the proper use of these herbicides. Contact your local Agriculture office or the Louisiana Cooperative Extension Service office nearest you for more information. A listing of all statewide offices of the Louisiana Cooperative Extension Service is provided at the end of this chapter.

### **Spraying Equipment Calibration**

Correct calibration is of great importance. An excessive amount of herbicide may cause damage to the applied area and increase herbicide costs. Insufficient amounts will probably not be effective in weed control. Sprayers and granular distributors should be checked for output before making a treatment. Following treatment, clean equipment and dispose of any unused spray properly.

## **Agricultural Aviation Operations Area**

Airports that have agricultural aviation operations should designate an area that will be used only for such operations. An agricultural operations area should be defined as the area on an airport that is used for loading agricultural airplanes. Depending on the volume of agricultural operations and whether it is economically feasible, it may be necessary to add an additional designated operational area. One area can be designated for the handling of liquid chemicals and the other area can be designated for the handling of dry non-toxic materials.

The designated agricultural operations area should be considered a special purpose area and should be designed to operate separately from the general aviation areas of the airport. This will allow the area to be restricted to agricultural aircraft and their support equipment only and will yield the highest level of safety and efficiency. In addition, the area should also restrict access from any public roads and any unauthorized personnel from the agricultural operations area.

## **Chemical Handling Area**

The chemical handling area should be located within the designated agricultural area. This area will be used for all aspects of handling liquid chemicals used for agricultural operations. Some of the aspects of handling liquid chemicals will include:

- Chemical handling
- Chemical mixing
- Loading or discharging chemicals onto or from the agricultural aircraft
- Washing the aircraft's internal spray system

Due to the fact that asphalt pavements tend to absorb spilled liquids and the effects of some of the liquid herbicides on asphalt pavements are unknown, it is recommended that the chemical

handling area be designated only on Portland Cement Concrete aprons. This area should be underlaid with a material that will not allow any seepage through to the underlying soil. This portion of the apron should be located away from drainage courses that might collect any chemical spills and thus contaminate the storm water drainage system. This apron area should also be sloped to a collection drain that will collect any spills and also collect any wash water. The liquids collected should be disposed of according to all Louisiana regulations and by a licensed non-hazardous waste disposal company and should be prohibited from entering the storm drainage system. This contractor could also be contracted to collect and dispose any other non-hazardous wastes on the airport property not particularly associated with only agricultural operations.

## **Dry Material Loading Area**

Generally, when aircraft agricultural operations use dry non-toxic materials, an area needs to be designated to allow enough space for the loading and unloading of this material. This area needs to allow room for the transport trucks delivering the material, the aircraft, and the hopper trucks that transfer the material from the transport trucks into the aircraft. Since these areas can be quite large, it may not be economically feasible to establish an area specifically for material handling. In some cases, these areas can be placed adjacent to the chemical handling areas, at closed runways or taxiways, or if large enough, on the general aviation apron. In each case, these areas should be restricted and kept separate from general aviation activities.

## **Herbicide Material Storage**

When dealing with herbicides and other chemicals, it is of primary concern that these materials are kept in a clean, secured, locked area. Improper storage, use and disposal of these materials can result in environmental contamination. The best way to prevent pollutant problems is at the source. Prevent or reduce the discharge of these pollutants by storing materials in a designated area, by installing secondary containment, by conducting regular inspections, and by training all employees on the proper uses of these materials.

As stated, an area should be designated for material delivery and storage. Keep an accurate, up-to-date inventory of the materials delivered and stored on-site. This will help in determining what type of response is needed in the event of a spill. Keep your inventory low by storing only the amount of materials that you need for a specific task. Whenever possible, store materials in a covered and/or enclosed area with a secondary containment such as an earthen dike, metal pan, or other containment device. These materials should not be stored directly on the ground. Drums or bagged materials should be placed on pallets and covered to prevent exposure to rainwater.

The designated storage area should be kept clean and well organized. The designated storage area should be routinely checked for external corrosion of material containers. An ample supply of spill cleanup materials should also be kept near the storage area.

## **Louisiana Cooperative Extension Service**

The Louisiana State University's Agricultural Center has instituted an extension service throughout the State for persons who seek assistance with agricultural questions or problems.

The service, known as the Louisiana Cooperative Extension Service, has an office located in every parish of the State. If you need more information on vegetation management or you have questions concerning any other facets of agricultural operations on your airport, please seek the office nearest you from the list provided.

**Acadia Parish Office**

157 Cherokee Drive  
Crowley, LA 70526-4353  
337/788-8821

**Allen Parish Office**

104 South Fourth Street  
P. O. Box 188  
Oberlin, LA 70655-0188  
337/639-4376 or -2985

**Ascension Parish Office**

9039 St. Landry Road  
P. O. Box 1659  
Gonzales, LA 70737-  
225/621-5799 or 225/473-6582

**Assumption Parish Office**

119 Robin Street  
Napoleonville, LA 70390-0188  
985/369-6386

**Avoyelles Parish Office**

136 South Lee Street  
Marksville, LA 71351-2609  
318/253-7526

**Beauregard Parish Office**

401 West First Street, Room 26  
P. O. Box 609  
De Ridder, LA 70634-0609  
337/463-7006

**Bienville Parish Office**

2710 Maple Street  
Arcadia, LA 71001-3606  
318/263-7400 or -7401

**Bossier Parish Office**

Courthouse Bldg., Room 309  
P. O. Box 370  
Benton, LA 71006-0188  
318/965-2326

**Caddo Parish Office**

2408 East 70th Street  
Shreveport, LA 71105-4702  
318/226-6805

**Calcasieu Parish Office**

7101 Gulf Highway  
Lake Charles, LA 70607  
337/475-8812

**Caldwell Parish Office**

106 Jackson Street  
P. O. Box 1199  
Columbia, LA 71418-1199  
318/649-2663 or - 5802

**Cameron Parish Office**

10086 Gulf Highway  
Grand Lake, LA 70607  
337/905-1318

**Catahoula Parish Office**

Courthouse Bldg. Room 302  
P. O. Box 160  
Harrisonburg, LA 71340-0160  
318/744-5442

**Claiborne Parish Office**

507 West Main Street  
Homer, LA 71040-0299  
318/927-3110

**Concordia Parish Office**

Old Courthouse Bldg.  
405 Carter Street, 3rd Floor  
Vidalia, LA 71373-3336  
318/336-5315

**De Soto Parish Office**

10117 Highway 171  
Grand Cane, LA 71032  
318/872-0533 or -0641

**East Baton Rouge Parish Office**

805 St. Louis Street  
Baton Rouge, LA 70802-6457  
225/389-3055

**East Carroll Parish Office**

502 First Street  
Lake Providence, LA 71254-9998  
318/559-1459

**East Feliciana Parish Office**

4419 Idlewild Road  
Clinton, LA 70722-0338  
225/683-3101

**Evangeline Parish Office**

230 Court Street  
Ville Platte, LA 70586-4493  
337/363-5646

**Franklin Parish Office**

Courthouse Building  
6252 Main Street  
Winnsboro, LA 71295  
318/435-7551

**Grant Parish Office**

200 Main Street, Suite 5  
Colfax, LA 71417-1863  
225/627-3675

**Iberia Parish Office**

Courthouse Building, Suite B-110  
300 Iberia Street  
P. O. Box 10025

New Iberia, LA 70560  
337/369-4441 or -4440

**Iberville Parish Office**

23640 Peters Street  
Plaquemine, LA 70764  
225/687-5155

**Jackson Parish Office**

Courthouse Building  
500 East Court Street, Room 302  
Jonesboro, LA 71251  
318/259-5690

**Jefferson Parish Office**

6640 Riverside Drive, Suite 200  
Metairie, LA 70003-7110  
504/838-1170, -1171, -1172

**Jefferson Davis Parish Office**

1006 Lake Arthur Avenue  
P. O. Box 1407  
Jennings, LA 70546-1407  
337/824-1773

**Lafayette Parish Office**

Parish Government Building  
1010 Lafayette Street, Suite 325  
Lafayette, LA 70501-6884  
337/291-7090

**Lafourche Parish Office**

402 West Fifth Street 70301 (zip code)  
P. O. Box 429  
Thibodaux, LA 70302-0429  
985/446-1316

**La Salle Parish Office**

Courthouse Building, Room 22  
North First and Courthouse Street  
P. O. Box 101  
Jena, LA 71342-0101  
318/992-2205 or -4179

**Lincoln Parish Office**

201 North Vienna Street  
Ruston, LA 71270-4464  
318/251-5134

**Livingston Parish Office**

Old Courthouse Bldg.  
20180 Iowa Street, Room 106  
P. O. Box 158  
Livingston, LA 70754-0158  
225/686-3020

**Madison Parish Office**

114 North Cedar Street  
Tallulah, LA 71282-3811  
318/574-2465 or -2483

**Morehouse Parish Office**

9609 Marlatt Street 71220 (zip code)  
P. O. Box 192  
Bastrop, LA 71221-0192  
318/281-5741 or -5742

**Natchitoches Parish Office**

624 Second Street  
P. O. Box 225  
Natchitoches, LA 71458-0225  
318/357-2224

**Orleans Parish Office**

6400 St. Claude Avenue  
Building 104-C  
New Orleans, LA 70146  
504/838-1170

**Ouachita Parish Office**

704 Cypress Street  
West Monroe, LA 71291-2922  
318/323-2251

**Plaquemines Parish Office**

479 F. Edward Herbert Blvd, Suite 201  
Belle Chasse, LA 70037  
504/433-3664

**Point Coupee Parish Office**

Courthouse Annex  
180 East Main Street, First Floor  
New Roads, LA 70760-3500  
225/638-5533

**Rapides Parish Office**

300 Grady Britt Drive  
Alexandria, LA 71302  
318/767-3968

**Red River Parish Office**

2015 Red Oak Road  
P. O. Box 1364  
Coushatta, LA 71019-1364  
318/932-4342

**Richland Parish Office**

702 Madeline Street  
P. O. Box 179  
Rayville, LA 71269-0179  
318/728-3216

**Sabine Parish Office**

1125 West Mississippi Avenue  
Suite B  
Many, LA 71449-3125  
318/256-3406

**St. Bernard Parish Office**

St. Bernard Government Bldg.  
8201 West Judge Perez Drive  
Chalmette, LA 70043-1611  
504/278-4234

**St. Charles Parish Office**

1313 Paul Maillard Road, Suite E  
P.O. Box 1766  
Luling, LA 70070  
985/785-4473 or -4474

**St. Helena Parish Office**

23 South Main Street, Suite B  
P. O. Box 1505  
Greensburg, LA 70441-0306

225/222-4136

**St. James Parish Office**

Courthouse Building  
5800 Highway 44, Third Floor  
P. O. Box 64



Convent, LA 70723-0064  
225/562-2320

**St. John Parish Office**  
P. O. Box 250  
Edgard, LA 70049-0250  
985/497-3261

**St. Landry Parish Office**

1065 Highway 749, Suite A  
Opelousas, LA 70570-9298  
337/948-0561

**St. Martin Parish Office**

114 Courthouse Street  
Breaux Bridge, LA 70517  
337/332-2181

**St. Mary Parish Office**

Courthouse Building  
500 Main Street, Room 314  
Franklin, LA 70538-6199  
337/828-4100, Ext. 300

**St. Tammany Parish Office**

1305 North Florida Street  
P. O. Box 5438 70434 (zip code)  
Covington, LA 70433  
985/875-2635

**Tangipahoa Parish Office**

305 East Oak Street  
P. O. Box 848  
Amite, LA 70422-0848  
985/748-9381 or -5462

**Tensas Parish Office**

Courthouse Annex  
203 Hancock Street  
P. O. Box 319  
St. Joseph, LA 71366-0319  
318/766-3222

**Terrebone Parish Office**

511 Roussel Street 70360 (zip code)  
P. O. Box 627  
Houma, LA 70361  
985/873-6495

**Union Parish Office**

210 Water Street  
Farmerville, LA 71241-3030  
318/368-9935

**Vermillion Parish Office**

1105 West Port Street  
Abbeville, LA 70510-5831  
337/898-4335

**Vernon Parish Office**

201 South Third Street  
P. O. Box 559  
Leesville, LA 71496-0559  
337/239-3231

**Washington Parish Office**

1104 Bene Street, Suite B  
Franklington, LA 70438-1135  
985/839-7855

**Webster Parish Office**

1202 Homer Road  
Minden, LA 71055-3082  
318/371-1371

**West Baton Rouge Parish Office**

210 Turner Road  
Port Allen, LA 70767-0498  
225/336-2416

**West Carroll Parish Office**

10284 Highway 17  
P. O. Box 620  
Oak Grove, LA 71263  
318/428-74444

**West Feliciana Parish Office**

5924 Commerce Street  
P. O. Box 1934  
St. Francisville, LA 70775-1934  
225/635-3614

**Winn Parish Office**

119 West Main Street, Room 108  
Winnfield, LA 71483-3201  
318/628-4528

## References

Louisiana State University Agricultural Center, Louisiana Cooperative Extension Service, "Louisiana's Suggested Chemical Weed Control Guide for 2007"

The Louisiana Department of Transportation and Development, "Small Airport Design"

# Chapter 12 - Wildlife Hazard Management

## Introduction

Wild animals are an important part of our environment, and they have served our needs in a number of ways. However, wildlife can adversely affect the public safety and health. Airports can be very attractive to various forms of wildlife. Birds, coyotes, wild boars, etc. are attracted to the wide open spaces an airport provides. When wildlife activity on an airport increases, it increases the likelihood of potentially hazardous conditions. Commercial, private, and military aircraft sometimes collide with birds and mammals during taxiing, takeoff, and landing. The Federal Aviation Administration (FAA) estimates that approximately 1,500 collisions between aircraft and wildlife are reported each year. These collisions not only result in millions of dollars worth of damage, but the lives of aircraft crew members and their passengers are at risk. The potential for human injury and deaths is increased significantly when wildlife is not kept away from airports.

This chapter will discuss the resources available to airport managers and also will give the steps that airports must take when wildlife poses a threat to the safe and effective operation of their airports.

## The Wildlife Services Program

Wildlife Services (WS), a unit of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), assists in solving problems that are created when species of wildlife cause damage to agriculture. WS personnel also assist with wildlife problems involving urban or natural resources as well as threats to human health and safety, such as potential bird strikes at airports. WS tries to strike a balance between wildlife and people and commits itself to the well being of wildlife and the environment. WS personnel try to develop a response that takes into consideration both economic and biological issues.

WS is a Federal cooperative program that responds to requests by persons and agencies needing help in controlling wildlife damage. Its field operations are conducted in accordance with all Federal and State guidelines and in cooperation with wildlife management professionals from Federal and/or State agencies. The WS has joined with the FAA and the U.S. Air Force in an effort to reduce bird-aircraft collisions at airports. Through all of its operations, WS programs are conducted to ensure no negative impact on wildlife populations.

The Louisiana regional office of Wildlife Services can be contacted at:

**USDA APHIS- Wildlife Services**  
**P. O. Box 589**  
**Port Allen, Louisiana 70767**  
**(225) 389-0229**  
**Fax: (225) 389-0228**

## **How WS Does Its Job**

The costs of most field activities performed by WS personnel are generally shared in part by Federal, State, local agencies, industry groups, or individuals requesting wildlife damage-control assistance. This cost sharing is an integral component of the WS program. When requested, WS provides help through technical assistance and direct control.

### **Technical Assistance**

WS employees will provide advice, recommendations, information, or materials for use in managing wildlife damage problems and helping threatened and endangered species to thrive. They also help by identifying the species responsible for the damage and the extent of the damage. WS can provide various recommendations to reduce the likelihood of wildlife damage or ways to reduce the specific wildlife populations to control the amount of damage they cause. WS personnel may suggest lethal or non-lethal techniques to resolve the wildlife damage problem. The WS sometimes recommend that regulatory agencies issue permits to allow owners to deal with wildlife problems themselves.

### **Direct Control**

When the land owner's efforts and the technical assistance offered has proved to be ineffective, direct control is usually provided. In these instances, WS provides field personnel to help whoever is experiencing the problem. The WS staff considers practical methods for resolving the wildlife damage problems and takes action by implementing appropriate measures.

## **Wildlife Management Strategy Formulation**

When determining the aspects of the wildlife problem or hazard, the airport's personnel should collect as much information as possible in order to assist the WS in developing an effective wildlife management program. This information will provide background conditions at the airport and the problems associated with the wildlife.

When preparing this information the airport personnel should observe the animal's habits, tracks, droppings or any other evidence that might be useful. Airport personnel should keep records of all types of birds and other species observed and thoroughly document all wildlife damage occurrences.

## Management Techniques

Deciding upon a particular action depends on a variety of factors, including the species type, the damage type, and the location of the damage. When considering the different types of wildlife management techniques, you should also consider:

- Available expertise in your area;
- Legal constraints of each technique;
- Relative effectiveness of each technique;
- Effects on non-targeted wildlife;
- Cost effectiveness of each technique.

In general there are four (4) types of action that can be considered for resolving wildlife damage occurrences. They are as follows:

- Cultural changes
- Mechanical techniques
- Removing or relocating the problem wildlife
- Extermination

### Cultural Changes

This is probably the most difficult technique to implement. This technique involves changing the habits and practices of airport personnel that attract the problem wildlife. For example, most birds are attracted to freshly cut grass because the grass cutting process stirs up insects, snakes and other food that different species of birds feed upon. Because birds often roost very early in the morning and late in the afternoon, an example of a cultural change would be to cut grass during these time periods instead of during the day so as to reduce the likelihood of any contact. Birds also have an instinctual need to see other birds while they are feeding and as a result birds tend to be attracted to areas of low cut grass. Maintaining a turf area that is between 7 inches to 14 inches high, also is effective in discouraging the attraction of large and small flocking birds. A cultural change, in this instance, would be to cut the grass at a higher length.

### Mechanical Techniques

This technique involves keeping the wildlife away from the problem areas. Examples of this technique would be installing physical barriers or electrifying existing fences to keep deer, wild boars, coyotes or other wildlife off of airport property. Installing noise making devices to scare away birds would also be an example of this technique.

### Removing And Relocating The Problem Wildlife

This technique involves relocating or removing the animals causing the problems. Snaring and removing the animals are some examples of this technique. Where no other alternative is available, cages and leghold traps are sometimes used for specific situations. Leghold traps now can be modified with padded or offset closures to make them more humane for target animals and to facilitate the release of non-target animals back to the wild with little or no injury.

## Extermination

Extermination of the native wildlife species is contrary to WS's policy and is often unwise and impractical. In some areas, exterminating some species is often illegal. Prior to any extermination effort, the airport sponsor should contact the Louisiana regional office of Animal Damage Control as well as the local Department of Wildlife and Fisheries.

Sometimes the most effective wildlife management technique is a combination of several methods or approaches, either all at once or one after the other. This is known as Integrated Pest Management (IPM). IPM is recommended to reduce damage by wildlife while minimizing any harmful effects of the control measures on humans, non-target wildlife, domestic livestock, and the environment.

## Bird Hazards And Landfills

Because aircraft have reduced airspeeds and altitudes during takeoffs and landings, they are more at risk to bird strike damage. Over 93% of all bird strikes reported occur below 2,000 feet above the ground level. Therefore, bird control at airports continues to be a very important aspect of an airport's overall safety program.

Each airport should have some type of management program established to identify the risk of bird strikes and attempt to reduce that risk as much as possible. As stated previously, cultural changes, mechanical techniques, and removing or relocating the problem wildlife are recommended options in reducing the risks of wildlife at airports. Ponds, clogged ditches, and low areas attract birds and need to be eliminated as much as possible. Because, birds have an instinctual need to see other birds while they are feeding, birds tend to be attracted to areas of low cut grass. Since some weeds produce seeds that attract insects, which in turn attract birds, it is important to keep all turf areas free of weeds. Therefore, maintaining a turf area that is between 7 inches to 14 inches high, is an effective method in discouraging the attraction of large and small flocking birds.

The most significant bird attraction however, is a landfill. Landfills near airports increase greatly the risk of possible bird strikes. According to the FAA, landfill sites that are within 5,000 feet of an airport used only by piston-engine aircraft and 10,000 feet of an airport used by turbine-engine aircraft are **not** considered compatible. Although the FAA cannot prevent landfill use, their objections can influence state licensing agencies. If there is a landfill near your airport, work with the landfill operator to help in reducing the attraction to birds and their population. If there are no landfills presently near your airport, work to keep it that way.

## Employee Training

As with any new program implemented on airports, all personnel involved should be properly trained. The goals of the training should be to teach personnel, at all levels of responsibility, all components of their specific wildlife management program, as well as keeping everyone informed and aware of the potential safety hazards that problems with wildlife can pose.

## Part 139 Certified Airports

### Wildlife Ecological Studies

A wildlife hazard is defined as a potential for an aircraft to have a collision with wildlife on or near an airport. Wildlife hazards can also include domestic animals that are out of the control of their owners. When the realization that a wildlife hazard may exist, a wildlife ecological study should be prepared to assess the wildlife condition. An airport wildlife ecological study is a formal report describing an airport's wildlife problem and the conditions leading up to this problem. A wildlife ecological study must be submitted to the Federal Aviation Administration (FAA) when any of the following occurs on or near an airport:

- An air carrier aircraft (an aircraft with a seating capacity of more than 30 passengers which is being operated by an air carrier) experiences a multiple bird strike or engine ingestion.
- An air carrier aircraft experiences a damaging collision with wildlife other than birds.
- Wildlife of a size or in numbers capable of causing an event as described above is observed to have access to any airport flight pattern or runway and taxiway areas.

The wildlife ecological study shall contain at least the following:

- Analysis of the events leading up the study.
- Identification of the species, numbers, locations, local movements, and daily and seasonal incidents of the wildlife observed.
- Identification and location of the features on or near an airport that attract wildlife.
- Description of the hazards the wildlife creates for air carrier operations.

Upon completion of this study it should be submitted to the FAA for determination of whether there is a need for a wildlife management plan. The FAA will make its determination based on the following:

- The wildlife ecological study submitted;
- The aeronautical activity at the airport;
- Any factors which might have a bearing on the current situation;
- The views of the airport users; and
- The views of the airport operator.

### Wildlife Hazard Management Plan

When the determination has been made that a wildlife hazard management plan is needed, the airport operator shall formulate and implement a plan using the ecological study as a basis. The wildlife hazard management plan's goals should be to lessen or eliminate wildlife hazards to aircraft operations. The wildlife hazard management plan shall include, at a minimum, the following information:

- The name of the person(s) responsible for the implementation of the plan.
- Priorities and completion dates for habitat modifications and changes in land usage as identified in the wildlife ecological study.
- Any required local, state, and Federal wildlife control permits.
- Identification of the resources the airport operator will provide in order to implement the plan.
- Procedures to be followed during air carrier operations, which should include:
  - (a) Assignment of personnel responsible for implementing the procedures;
  - (b) Physical inspections of the runways and taxiways and other areas of wildlife management before any air carrier operations so as to allow time for wildlife controls to be effective;
  - (c) Wildlife control methods; and
  - (d) Communication between the wildlife control personnel and any air traffic control tower in operation at the airport.
- Periodic review and evaluation of the wildlife hazard management plan to see if the plan is effective in dealing with the wildlife hazard, and to see if the existing wildlife hazard, as described in the ecological study, needs to be reevaluated.
- Training programs providing airport personnel with the knowledge and skills needed to implement the wildlife hazard management plan.

Once the wildlife hazard management plan has been prepared, it should be sent to the FAA to await approval prior to its implementation.

## References

Federal Aviation Regulations, Part 139, "Certification and Operations: Land Airports Serving Certain Air Carriers".

United States Department of Agriculture, Animal and Plant Health Inspection Services, Program Aid Number 1753, "Managing Wildlife Damage: The Mission of APHIS' Wildlife Services Program".



# Chapter 13 - Runway And Taxiway Marking

## Introduction

Correctly marking the paved surfaces of an airport is fundamental in operating an airport safely and effectively. Making sure these markings stay visible is equally as important. The Federal Aviation Administration's (FAA) Advisory Circular AC 150/5340-1J "Standards for Airport Markings" describe the standards for paved area marking used on airports. This chapter will provide information on marking paved runways, taxiways, and closed or hazardous areas. The FAA's Advisory Circular AC 150/5340-1J "Standards for Airport Markings", which includes the **figures and diagrams**, is attached **on the enclosed CD** for reference.

## Runways

Runways are defined rectangular surfaces, on an airport, prepared or suitable for the landing or takeoff of airplanes. The colors of markings on runways are white. A runway should be marked according to its usage. The three classifications of runways are *Visual Runways*, *Nonprecision Instrument Runways*, and *Precision Instrument Runways*. A *Visual Runway* does not have an existing or planned straight-in instrument approach procedure. A *Nonprecision Instrument Runway* has an existing instrument approach procedure which uses navigational aids with only horizontal or lateral guidance to the airport or runway. A *Precision Instrument Runway* has an existing instrument approach procedure using a precision instrument landing system, which provides both lateral and vertical guidance to a runway end.

### *Marking Precedence*

Where multiple runways intersect, the markings on the runway of the higher classification continue through the intersection, while the markings of the lower classification are interrupted. The one exception is that the runway threshold marking, designation, marking, and touchdown zone markings are relocated along the lower classification runway to avoid the intersection area. For intersections of runways of the same classification, the preferred runway (lowest approach minimums or most often used) is considered to be of a higher precedence order. For marking purposes, the classifications, in descending order is as follows:

1. Precision instrument runway, Category III
2. Precision instrument runway, Category II
3. Precision instrument runway, Category I
4. Non-precision instrument runway
5. Visual runway

### *Runway Designation Marking*

Runways are identified by the white numbers painted on the end of each runway. These numbers also represent the runway centerline's compass heading to the nearest 10-degree increment. The runway centerline's compass heading is measured clockwise from the magnetic north when viewed from the direction of approach. For example, where the compass heading of

a runway is 174 degrees, the runway designation would be “17”; and for a compass heading of 87 degrees, the runway designation would be “9” (rounded up). For a compass heading ending in “5”, such as 185, the runway designation marking could either be “18” or “19.” A single-digit runway designation number should not be preceded by a zero. For parallel runways, the runway designation will have the same number but they must be followed by “L” or “R” designating the left or right position of the runways when viewed from the direction of the approach. The size of the painted runway designation numbers should be 60 feet tall and 20 feet wide.

### ***Runway Centerline Markings***

Centerline markings on runways identify the physical center of the runway and provides alignment guidance during landing and takeoff. The runway centerline markings are white and are located along the centerline of the runway between the runway designation markings. These markings consist of a line of uniformly spaced stripes and gaps. The stripes are 120 feet long and have gaps that are 80 feet in length. Any adjustments to the length and gaps of the stripes that may be needed because of runway length are to be made near the runway midpoint. The minimum width of each stripe is 12 inches for visual approach runways, 18 inches for nonprecision instrument runways, and 36 inches for precision instrument runways.

### ***Runway Threshold Marking***

A threshold marking identifies the beginning of the runway that is available and suitable for landing. The runway threshold markings consist of eight white longitudinal stripes of uniform dimension arranged evenly about the runway centerline. These markings start 20 feet from the runway threshold.

The stripes must be 150 feet long, 5.75 feet wide, and spaced 5.75 feet apart except the center space which is 11.5 feet apart. The stripes extend sideways to within 10 feet from the edge of the runway or to a distance of 90 feet on either side of a runway centerline, whichever is the smaller lateral distance. (See table next page.)

<b>RUNWAY WIDTH</b>	<b>NUMBER OF STRIPES</b>
<b>60 feet</b>	<b>4</b>
<b>75 feet</b>	<b>6</b>
<b>100 feet</b>	<b>8</b>
<b>150 feet</b>	<b>12</b>
<b>200 feet</b>	<b>16</b>

### ***Runway Aiming Point Marking***

An aiming point marking provides jet aircraft a visual aiming point for landing operations. The aiming points are white and the beginning of these markings are located 1,020 feet from the threshold. The aiming points consist of two rectangular markings, 150 feet in length, located on each side of the runway centerline. The width of each marking is 30 feet for a runway with a width of 150 feet or greater. The spacing between the inner sides of the markings is 72 feet for a runway width of 150 feet or greater. For runways that are less than 150 feet wide, the width of the markings and the space between the inner sides of the markings is decreased in proportion to

the decrease in the width of the runway. Where there are touchdown zone markings, the space between the inner sides of the markings should be the same as that of the touchdown markings.

### ***Runway Touchdown Zone Marking***

The touchdown zone markings identify the touchdown zone for landings and are coded to provide distance information. These markings are white and consist of groups of one, two, and three rectangular bars evenly arranged in pairs along the runway centerline. For runways less than 150 feet in width, the markings and spaces are reduced proportionally, but the lengths remain the same. On runways having touchdown zone markings at both ends, the pairs of markings which extend to within 900 feet of the runway midpoint are eliminated. The fixed distance markings are a part of the touchdown zone markings but are used alone on nonprecision instrument runways and visual runways 4,000 feet in length or longer used by jet aircraft. Touchdown zone markings are required on runways with precision instrument approaches.

### ***Runway Side Strip Marking***

Runway side stripe markings provide a visual distinction between the runway and the surrounding terrain and also outline the runway width. Runway side stripes are white and consist of continuous stripes located along each side of the runway. The maximum distance between the outer edges of the stripes is 200 feet. The stripes have a minimum width of 36 inches for precision instrument runways and are at least equal to the width of the runway centerline stripes on other runways. The stripes extend to the end of displaced threshold areas which are used for takeoffs and rollouts. Side stripes are required on precision instrument runways.

### ***Runway Threshold Bar***

A threshold bar identifies the beginning of the runway that is available for landing when there is pavement aligned with the runway on the approach side of the threshold. A threshold bar is white and is located on the landing runway at the threshold. The threshold bar is 10 feet wide and extends across the width of the runway.

### ***Demarcation Bar***

A demarcation bar identifies a runway with a displaced threshold from a blast pad, stopway or taxiway that precedes the runway. The demarcation bar is yellow and is located on the blast pad, stopway or taxiway at the point where the runway intersects. The demarcation bar is 3 feet wide and extends across the width of the blast pad, stopway or taxiway.

### ***Arrows And Arrowheads***

Arrows are used to identify a displaced threshold area and are useful for centerline guidance for takeoffs and/or rollouts. Arrowheads are used in connection with a threshold bar to highlight the beginning of a runway where the use of chevrons is not appropriate. Arrows and arrowheads used in a displaced threshold area are white. Arrowheads used on taxiway prior to a runway threshold are yellow.

When a runway threshold is permanently displaced, the rows and arrowheads are located in the portion of the runway before the displaced threshold. Where the pavement area before a runway is used as a taxiway, arrowheads are located prior to the threshold bar. Please refer to the FAA Advisory Circular AC 150/5340-1J, “Standards for Airport Markings”, for dimensions and spacing of arrows and arrowheads.

### ***Chevrons***

Chevrons are used to identify pavement areas unusable for landing, takeoff, and taxiing. Chevrons are yellow and are located on pavement areas that are aligned with and adjacent to the runway. Please refer to the FAA Advisory Circular AC 150/5340-1J, “Standards for Airport Markings”, for dimensions and spacing of chevrons.

### ***Markings For Blast Pads And Stopways***

A runway blast pad is a surface near the ends of runways provided to reduce the erosive effect of jet blast and propeller wash. A runway stopway is a defined surface beyond the end of the runway that was designed to be suitable for supporting an aircraft, without damaging that aircraft, during an aborted takeoff. All markings on blast pads and stopways are painted yellow.

## **Taxiways**

Taxiways are defined as the paths that are used for the taxiing of aircraft from one part of an airport to another. All taxiway markings are yellow.

The different types of taxiway markings are as follows:

- Taxiway Centerline Marking
- Taxiway Edge Marking
- Holding Position Markings
- Markings for a Taxiway in Front of a Runway

### ***Taxiway Centerline Marking***

Taxiway centerlines are marked to provide a visual identification of the designated taxiing path. Taxiway centerlines are yellow and consist of a continuous stripe along the centerline of the designated taxiway. On a taxiway curve, the markings continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway. A width of between 6 inches and 12 inches wide is acceptable provided the width selected is uniform for its entire length. The centerline will be continuous in length except where it intersects a holding position marking or runway marking element. For taxiway intersections designed for the straight- thorough method of taxiing, the centerline markings continue straight through the intersection.

At taxiway intersections with a runway end, the taxiway centerline marking is terminated at the runway edge, (with the exception of the situation where there is a displaced threshold, in which case the taxiway centerline may be extended onto the runway displaced area). On taxiways used as an entrance or exit to a runway, the taxiway centerline marking curves onto the runway and extends parallel to the runway centerline marking for 200 feet past the point where the two

markings become parallel. For taxiways crossing a runway, the taxiway centerline marking may continue across the runway but must be interrupted for the runway markings.

### ***Taxiway Edge Marking***

Taxiway edge markings are used to delineate the edge of the taxiway. They are used when the taxiway edge does not correspond with the edge of the pavement and where the full strength pavement of the taxiway is not readily visible. Taxiway edge markings are yellow and can either be continuous or dashed. Continuous taxiway edge markings are used to identify the taxiway from the shoulder or some other surface not intended to be used by aircraft. Dashed taxiway edge markings are used when the aircraft would need to cross the lines, for example when a taxiway enters or crosses aprons. Continuous taxiway edge markings consist of a continuous double yellow line, each being at least 6 inches in width and spaced 6 inches apart. Dashed taxiway edge markings consist of a broken double yellow line, each being at least 6 inches wide spaced at 6 inches apart from edge to edge. The lines are 15 feet in length with 25 foot gaps.

### ***Runway Holding Position Markings On Taxiways***

Holding position markings identify the location on a taxiway where an aircraft is supposed to stop while awaiting clearance to proceed onto the runway. Holding position markings should be located on all taxiways that intersect runways based upon the most critical aircraft using the runway.

There are four types of holding position markings. These markings are outlined with black lines and black interim spaces if needed for improved visibility on light colored (such as Portland cement) pavement areas. They are as follows:

- Holding Position Markings for Taxiway/Runway Intersections
- Holding Position Markings for Runway/Runway Intersections
- Holding Position Markings for Taxiway/Taxiway Intersections
- Holding Position Markings for Instrument Landing System (ILS) Critical Areas

#### **Holding Positions Markings For Taxiway/Runway Intersections**

Holding position markings for taxiway/runway intersections are indicated with two solid lines followed by two broken lines. The solid lines are always on the side where the aircraft is to hold. The markings are installed perpendicular to the taxiway centerline as seen in **Figure 13.1**.



**Figure 13.1 Runway Holding Position Marking**

### Holding Positions Markings For Runway/Runway Intersections

Holding position markings for runway/runway markings are identical to the holding position markings for taxiway/runway intersections (see **Figure 13.1**). The solid lines of these markings are also always on the side where the aircraft is to hold. However, these markings should only be installed on a runway where that portion of the runway is used as a taxiway or used for “land and hold short” operations.

### Holding Positions Markings For Taxiway/Taxiway Intersections

Holding position markings for taxiway/taxiway intersections are indicated with a single line of dashes and spaces. These markings should only be installed at taxiway/taxiway intersections where there is an operational need to hold aircraft at this point, and are often not necessary. These markings are installed perpendicular to the taxiway centerline as seen in **Figure 13.2**.



Figure 13.2 Intermediate Holding Position Markings

### Holding Positions Markings For ILS Critical Areas

The holding position markings for ILS critical areas are indicated with a set of two parallel lines spaced four feet apart, in between these two lines and perpendicular to them are sets of two parallel lines spaced one foot apart as seen in **Figure 13.3**. Due to their appearance, these markings are commonly referred to as a “ladder” or “rail road tracks”. The holding position markings for ILS critical areas identify the location on a taxiway where an aircraft is supposed to stop when it does not have clearance to enter these critical areas. These critical areas are used to protect the navigational aid signal or the airspace required for the approach procedure. These markings are installed at the perimeter of the ILS critical area and are perpendicular to the taxiway centerline. Where the distance between the taxiway/runway holding position and the holding position for an ILS critical area is 50 feet or less, one holding position may be established, provided it does not affect capacity. The local FAA airways facilities office will help designate the ILS critical areas for the airport operator.

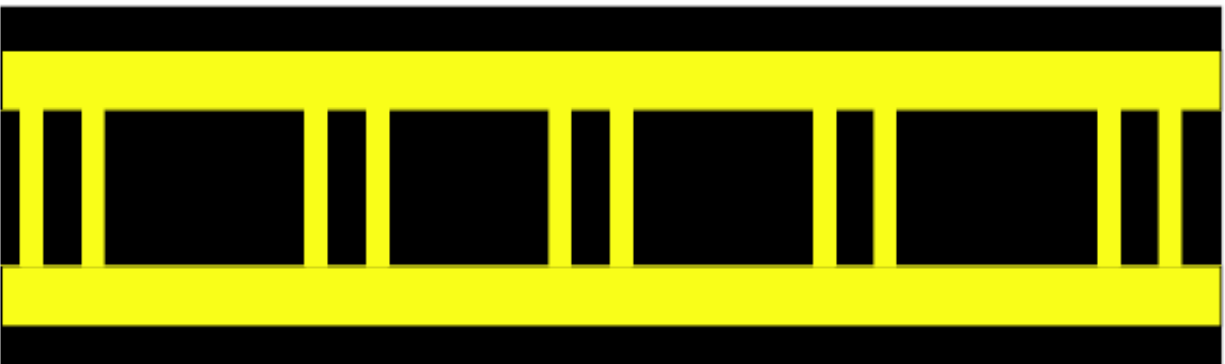


Figure 13.3 ILS/MLS Holding Position Marking

## Other Markings

### *Permanently Closed Runways And Taxiways*

For permanently closed runways, the threshold, the runway designation, and the touchdown zone markings are removed and crosses are placed at each runway end and at 1,000-foot intervals. If the closed runway intersects an open runway, crosses should be placed on the closed runway on both sides of the open runway. For taxiways, a cross is placed on the closed taxiway at each entrance. The crosses are 60 feet square for runways and half that size for taxiways. The lighting circuits should also be disconnected for runways and taxiways which have been permanently closed.

### *Temporarily Closed Runways And Taxiways*

Temporarily closed runways and taxiways are treated as if they are permanently closed runways and taxiways with the exception that the runway markings are not removed, and temporary crosses are placed only at the runway ends on the top of the runway numerals. For temporary marking, the dimensions of the crosses may be reduced to permit the use of standard sheets of 4- by-8-foot of plywood. Temporarily closed taxiways are usually treated as a hazardous area, as explained below.

### *Closed Airports*

When all the runways are closed temporarily, the runways are marked as “temporarily closed runways” and the airport beacon is turned off. When all the runways are closed permanently the runways are marked as “permanently closed runways”, the airport beacon is disconnected, and a cross is placed in the segmented circle or at a central location if no segmented circle exists.

### *Hazardous Areas*

Hazardous areas are areas where no part of an aircraft may enter. These areas are delineated by barricades with alternate orange and white markings. The barricades are supplemented with orange flags a minimum of 20 by 20 inches square and made and installed so that they are always in the extended position and properly oriented. For nighttime use, the barricades are supplemented with flashing red lights. Barricades, flags, and lights must be appropriately placed so as to adequately define and delineate the hazardous area.

### *Notices To Airmen (NOTAMs)*

A NOTAM is a formal notification that describes information on hazardous conditions or unexpected changes to the airport that are not included in the associated charts and related publications. The airport owner (or operator) must provide information on closed or hazardous conditions to the local air traffic control facility so that a NOTAM can be issued. Only the Airport Manager or delegated authority can issue NOTAMs on landing areas. When issuing a NOTAM always provide the airport’s name, the NOTAM information, an estimate of the duration of the NOTAM, and the name and phone number of the person issuing the NOTAM.

The Airport Manager should periodically check to ensure that the most current and correct information is being published concerning their airport by calling the Federal Aviation Administration Automated Flight Service Station at 1-800-992-7433.

### ***Stabilized Areas***

Holding bays, aprons, and taxiways are sometimes provided with shoulder stabilization to prevent blast and water damage and erosion. This stabilization may have the appearance of full strength pavement but is not intended for aircraft use. Usually taxiway edge markings will define this area, yet there may be areas where confusion exists, such as stabilized islands or taxiway curves. Where such confusion exists, the stabilized area is marked with 3-foot stripes perpendicular to the edge stripes. On straight sections, the marks are placed at a minimum of 100-foot spacing. On curves, the marks are placed a maximum of 50 feet apart along the curve. The stripes are extended to 5 feet from the edge of the stabilized area or to 25 feet in length, whichever is less.

### ***Runway Shoulder Markings***

Usually the runway side stripes will indicate the edges of the full strength pavement. However, conditions may exist, such as exceptionally wide runways, where there is a need to indicate the area not intended for aircraft use. In such cases, runway shoulder markings are used as a supplement to runway side stripes. Runway shoulder markings are located between the runway side stripes and the pavement edge. Runway shoulder markings consist of white stripes of 3 feet in width and spaced 100 feet apart. The stripes start at the runway midpoint and are slanted at an angle of 45 degrees to the runway centerline.

## **Painting Techniques**

All Paints used on airport runways and taxiways should meet Federal Specification standards TT-P-1952 for water emulsion base. Glass spheres can be added to the paint to provide more visibility and add more traction to pavement surfaces during wet conditions. These glass spheres should meet the Federal Specification TT-B-1325, Type III, Gradation A.

All painting of runways and taxiways should be performed during dry weather conditions when temperatures are above 45° F. Painting should also not occur during foggy or windy conditions. Prior to painting, all surfaces should be cleaned and made free of any dirt, grease, oil, or any other material that could affect the paint from adhering to the pavement. It should be noted that paint should not be applied to Portland Cement Concrete pavements until the concrete area that is to be painted is clean of all curing material. A high-pressure washer using water or sandblasting may be used to remove this curing material.

All paint should be mixed according to the instructions provided by the manufacturer and applied using a marking machine at a recommended rate of 100 to 110 square feet per gallon. This marking machine shall be a machine that is suitable for applying traffic paint. Thinner is not permitted when painting runways and taxiways. Following the painting process, all runways



and taxiways painted should be protected until the paint is dry. A period of 24 hours should be allowed following application of water emulsion base paint.

## References

Federal Aviation Administration Advisory Circular AC 150/5300-13, "Airport Design"

Federal Aviation Administration Advisory Circular AC 150/5340-1J "Standards for Airport Markings"

Federal Aviation Administration Advisory Circular AC 150/5370-10B, "Standards Specifying Construction of Airports"

# Chapter 14 – Airport Operations Manual

## Introduction

All public use airports in Louisiana must be open for use by the general public as well as a myriad of other types of aeronautical activity. An airport must contain some established rules and regulations in order to provide effective and safe operation of the airport. There should also be adequate access controls including fencing and other facilities to keep motorists, cyclist, pedestrians, and animals from inadvertently wandering onto runways or taxiways. Local air traffic regulations may require the establishment of uniform flight patterns for orderly approaches and departures. As with any public use facility, there must be adequate rules governing vehicular traffic, sanitation, security, crowd control, access to restricted areas, and fire protection.

This chapter provides information on rules and regulations for airports. It also provides a model set of rules and regulations which may easily be adapted to fit the specific requirements of any given airport.

## Airport Operations Manuals

Rules and regulations are usually prepared as part of an airport's operations manual. An airport's operation manual is usually developed by the airport's local governing body, through the Airport Authority, to establish the objectives, policies, standards, rules, regulations and procedures necessary for the proper management and operation of that airport. Airport operations must achieve the highest degree of operating efficiency and safety possible while being in compliance with the requirements of the State of Louisiana and the Federal Aviation Administration. According to the Louisiana Law Revised Statutes Title 2, a draft operations manual should be provided to the LA DOTD Aviation Section for comment and approval. Some elements that should be included in an Airport's Operation Manual are as follows:

- **Introduction**
- **Airport rules and regulations**
- **Minimum standards and requirements for the conduct of aeronautical services and activities**
- **Physical features of airport and information concerning support services such as utilities**
- **Airport inspection and maintenance procedures**
- **General safety issues**
- **Airport emergency plan**
- **Land leasing procedures**
- **Commercial operator leasing procedures**
- **Tie-down and aircraft parking agreement procedures**

## Sample Rules And Regulations

Each airport has different conditions and characteristics that separate it from others. Therefore no two airports should have an identical set of rules and regulations. However, since most airports encounter similar situations, the following pages contain some typical rules and regulations and guidelines. These rules should be used to assist each airport in establishing their own specific set of guidelines that represent the conditions that exist at their airport.

The Local Airport Authority/should approve the rules and regulations, and once approved they should be printed and distributed to all airport tenants, pilots, the LA DOTD Aviation Section and any other individuals who request them.

# THIS IS ONLY A SAMPLE

## RULES AND REGULATIONS

\_\_\_\_\_Airport

### A. GENERAL RULES

1. All users of and persons on the airport shall be governed by these regulations and by any emergency directives that may be issued pursuant to Paragraph A.7. hereof. These regulations supersede any previously published and are subject to change by the Airport Owner, at any time.
2. These regulations are not intended to amend, modify or supersede any provisions of Federal, State, or Parish law.
3. If any portion of these regulations shall be ruled to be invalid or unenforceable, all other portions shall nevertheless remain in effect.
4. **Amendments to Rules and Regulations:** Future amendments, additions, deletions or corrections to these rules and regulations may be promulgated by the Airport Authority and shall be filed with the District Secretary.
5. **Special Regulations, Notices or Directives:** Special Regulations, notices, memorandums or directives of an operational nature of interest to persons engaged in business on the airport shall be issued under the authority of these regulations.
6. The Airport Manager, or other persons so designated by the Airport Authority, is authorized to install such traffic control signs on the Airport as may be necessary in order to properly control and regulate vehicular traffic.
7. **Emergency Powers of the Airport Manager:** When an emergency exists at the airport, the Airport Manager is empowered to issue such directives and to take such action which within his discretion and judgment is necessary or desirable to protect persons and property and expedite the operation of the airport. Such directives and

actions of the Airport Manager shall have the force of a regulation thereunder so long as said emergency exists.

8. **Posting of Rules and Regulations:** Any airport tenants shall post a copy of these Rules and Regulations in a conspicuous location for the use of employees and customers.
9. **Non-liability of Parish:** The permission granted to use the airport and its facilities, or to fly to, from, or over the same, shall be at all times conditioned upon the assumption of full responsibility therefore by every person exercising or taking advantage of such permission. It shall be a further condition thereof that each person, as a consideration for the use of the airport and for its facilities, shall at all times release, hold harmless and indemnify the Parish Council, through the Airport

Authority, and their agents and employees from any and all responsibility, liability, loss or damage, resulting to any such person, or caused by or on his or her behalf, and incident to the manner in which the airport is operated, constructed or maintained, or served from within or without, or used from without. The use of the airport by any person for any purpose, or the paying of fees therefore, or the taking off or landing aircraft thereon, shall be itself an acknowledgment that such person accepts such privileges on the condition herein set forth.

10. **Categories of Aircraft:** For proper determination of the conditions of use of \_\_\_\_\_ Airport, certain categories have been established by the Airport Authority. Final determination as to the proper category designation of any aircraft shall rest with the Airport Manager, in accordance with the following:

**a. Private**

- (1) Privately owned aircraft will be operated noncommercially by owner or owners.
- (2) The aircraft can be used in connection with the owner's business in a manner comparable to the owner's use of his private automobile.
- (3) Company and corporation owned aircraft that are operated for the transportation of their and other personnel and/or products are classified as private aircraft.
- (4) Club aircraft must be owned and operated by a non-profit partnership or non-profit Louisiana corporation, and each club member must be a bona fide owner of a part of the aircraft or a share in the corporation. The club may not derive greater revenue from the use of its aircraft than the amount necessary for the operation, maintenance and replacement of its aircraft and will file and keep up to date with the Airport Manager a list of membership. At any time the Airport Manager has reason to believe that a club aircraft is being so operated that it falls under the "commercial" classification there under, he shall so notify the club and if they fail to remedy conditions complained of, the Airport Manager shall reclassify the aircraft and levy fees necessary to the pertinent type of operation.
- (5) Aircraft for Sale: New or old aircraft held for sale may be demonstrated to prospective purchasers, or, when sold, may be used to instruct the new owner of their operation.

**b. Commercial**

Aircraft used:

- (1) To carry passengers for hire.

- (2) For rental, hire or charter.
- (3) Student instruction and its kindred occupations.
- (4) Any aircraft used for commercial purposes and not otherwise covered in these regulations.

## B. GENERAL REGULATIONS

1. **Advertising** - No person or organization shall post, distribute or display signs, advertisements, literature, circulars, pictures, sketches, drawings, or other forms of printed or written matter on the airport except with the prior written authorization of the Airport Authority and in such manner as he may prescribe.
2. **Solicitation** - No person shall engage in any form of solicitation or offer merchandise or services for sale on the airport without obtaining prior written authorization from the Airport Authority.
3. **Public and Tenant Usage** - All persons using the airport shall at all times abide by the following rules and regulations: pertinent information as requested by the officer in charge. For all accidents involving aircraft, a copy of the report will be forwarded to the Baton Rouge FAA General Aviation District Office and State Office of Aviation and Public Transportation.
  - a. **Disorderly Conduct** - No person shall be or become intoxicated or drunk, commit any disorderly, obscene or indecent act, or commit any act of nuisance, nor conduct or engage in any form of gambling on the Airport.
  - b. **Sanitation** - No person shall dispose of garbage, papers, refuse or other material on the Airport except in the receptacles provided for that purpose; nor use a comfort station other than in a clean and sanitary manner.
  - c. **Preservation of Property** - No person shall destroy, injure, deface or disturb in any way any building, sign, equipment, marker or other structure, trees, flowers, lawn or other property on the Airport; not alter, make addition to, or erect any building or sign or make any excavations on the Airport: nor willfully abandon any personal property on the Airport. In addition to any other penalty provided in these rules, civil law provides that any such action be considered as a misdemeanor. Any person causing or liable for damage of any nature shall report such damage to the Airport Authority office and, upon demand by such office, shall make reimbursement for the full amount of the damage. Anyone failing to comply with this regulation may be refused admittance to the airport until the Airport Authority has been fully reimbursed for damage done.
  - d. **Explosives and Other Dangerous Articles** - No persons, except peace officers, U.S. Government agents, duly authorized Post Office and Airport employees or members of the Armed Forces of the United States on official duty, shall carry loaded weapons on the Airport. Nor shall any person store, keep, handle, use, dispense or transport at, in or upon the airport any hazardous or dangerous articles (as defined in the Interstate Commerce Commission Regulations for transportation of explosives or other dangerous articles), at such time or place or in such manner or condition as to endanger unreasonably or as to be likely to endanger unreasonably persons or property.
  - e. **Interfering or Tampering With Aircraft** - No person shall interfere or tamper with any aircraft or put in motion the engine of such aircraft, or use any aircraft, aircraft parts, instruments or tools without permission of the owner or by specific direction of the Airport Manager.

- . f. **Restricted Areas** - No person shall enter upon the field area, utilities and service rooms or areas, or other areas as may be designated RESTRICTED except:
  - (a) Persons assigned to duty therein.
  - (b) Persons authorized by the Airport Manager.
  - (c) Business representatives in the conduct of their affairs with the FBO or other tenants.
- g. **Use of Roads and Walks** - No person shall travel on the Airport other than the roads, walks, or places provided for the particular class of traffic. No person shall occupy the roads or walks in such a manner as to hinder or obstruct their proper use.
- h. **Loitering and Refusal to Comply** - No person shall loiter or loaf on any part of the Airport or in any building on the Airport; nor shall any person come upon or use the Airport, except while traveling through as a passenger or while enplaning or deplaning as a passenger on an aircraft operating on the Airport, after such person has been denied the use of the Airport by the management.  
Any person or persons who refuse to comply with these applicable rules and regulations, after proper request to so do by the Airport Manager or other authorized representative, shall be requested to leave the Airport and in the event of failure to comply with a proper request to abide by the rules and regulations of the Airport, shall be regarded as a trespasser.
- i. **Use of Shop Areas** - All shops, garages, equipment and facilities are expressly for the conduct of the owner's or lessee's business and operations. No persons other than employees of the owner or lessee shall make use of these facilities or loiter around such premises without individual and specific permission of the owner or lessee.
- j. **Conduct of Business or Commercial Activity** - No person shall engage in any business or commercial activity of any nature whatsoever on the Airport except with the approval of the Airport Authority, and under such terms and conditions as may be prescribed.
- k. **Open Flame Operations** - No person shall conduct any open-flame operations in any hangar or on the Airport unless specifically authorized by the Airport Manager. Where welding or cutting is a necessity for repairs or alterations in any airport area whether by outside contractors or by tenants, the following procedures must be followed:
  - (1) Permission must be received from the Airport Manager.
  - (2) Someone must be assigned to watch the areas involved and to carefully check it and the adjoining areas for one-half hour after the work is completed. Flying sparks from welding are frequently thrown into remote places where material may smolder for hours before bursting into flame.
  - (3) When welding outdoors, make certain sparks do not enter doors or windows.
  - (4) Where welding or cutting is performed near open floor drains, caution should be exercised because of the possible presence of sewer gas and solvents that have drained from the hangar floors. All drains should be well flushed before commencing operations.
  - (5) When it is necessary to weld or cut metal in areas classified as hazardous areas such as hangars or shops where volatile materials are used or areas where volatile materials are stored., the following additional procedures shall be followed:
    - \* Where welding or cutting is to be performed in a hangar:
  - (6) All aircraft shall be removed from the hangar.
  - (7) All volatile materials and liquids shall either be removed or properly enclosed in metal cabinets away from the area involved.

- (8) Hangar floors shall be well watered down and hangar doors on the ramp side open.
- (9) Men with fire hose or ample fire extinguishers shall be stationed to insure that sparks are controlled. A minimum of one 50 pound dry chemical extinguisher shall be on hand.

Where welding or cutting is to be performed in a shop area containing combustible materials:

- (10) All necessary precautions shall be taken.
- (11) All movable combustibles shall be moved at least 35 feet (10 meters) away.
- (12) Combustibles which cannot be moved shall be covered with sheet metal.

**l. Smoking** - No person shall smoke in any hangar or shop, service station area, gasoline storage area, or in any building, room or place on the Airport where smoking is specifically prohibited.

**m. Accidents** - All persons involved in any accident, personal, aircraft, or automotive, occurring on the premises of \_\_\_\_\_ Airport shall advise the Airport Authority office, and make a report to the \_\_\_\_\_ Parish Sheriff's Department as soon as possible, giving all

#### **4. Building Requirements and Ground Rentals**

Any person desiring to erect or construct any building on the Airport shall be required to submit plans and specifications for the same to the Airport Authority. The plans shall also include a general layout, drawn to scale, showing the desired amount of ground actually required for the operation of such activities in addition to the portion occupied by the building proper. Doors on all buildings shall not protrude or extend beyond the building line as established by these regulations.

All buildings erected upon the Airport shall conform to any Building Code requirements adopted by \_\_\_\_\_ Parish and be approved by the State

Fire Marshall. They must be of either steel, concrete, masonry or other fireproof construction. Temporary permits may be granted for a period not to exceed one year, to construct temporary shelter in a space to be designated by the Airport Authority. Such temporary building must be removed at the expense of the owner with ten days' notice in writing by the Airport Authority. Waivers of this section may be granted only by approval of the Airport Authority. State approval must be acquired on all construction in accord with **R.S. 2:139** and **FAR Part 77** requires that the FAA be notified and a Form 7460-1 must be completed and forwarded to the FAA Airports District Office, as described in **FAA AC 70/7460-1E**.

When plans have been approved by the Airport Authority and the State Division of Aviation and Public Transportation, a lease may then be entered into at the rate prescribed by the Airport Authority.

#### **5. Trash Containers**

No person shall keep unsafe trash containers in any area. No vehicle used for hauling trash, dirt, or any other material shall be operated on the Airport unless such vehicle is constructed so as to prevent the contents thereof from dropping, blowing, sifting, leaking or otherwise escaping there from. Areas to be used for trash or garbage containers shall be designated by the Airport Authority and no other areas shall be used for this purpose. Such areas shall be kept clean and sanitary at all times.

**6. Storage of Equipment**

No tenant or lessee on the Airport shall store or stack material or equipment in such a manner as to constitute a hazard to personnel or property.

**7. Maintenance**

All tenants shall be required to maintain their leased property in a condition of repair, cleanliness and general maintenance in a manner agreeable to the Airport Authority and in accordance with their individual lease agreements and free from all fire hazards.

**8. Fire Equipment**

All tenants or lessees shall supply and maintain such adequate and readily accessible fire extinguishers as are approved by fire underwriters for the particular hazard involved.

**9. Structural and Decorative Changes**

No tenants, lessees or grantees will be permitted to effect structural or decorative changes or additions of any type without prior permission and approval of the Airport Authority.

**10. Damages**

Tenants, lessees and grantees shall be fully responsible for all damages to buildings, equipment, real property and appurtenances at the airport caused by negligence, abuse or carelessness of their employees, agents, customers, visitors, suppliers or persons with whom they may do business.

**12. Payment of Utility Charges**

- a. All billings are payable upon presentation unless otherwise noted thereon.
- b. All percentages or income charges are payable within thirty (30) days of the end of the accounting period unless otherwise stipulated in writing.

## **C. AIRFIELD OPERATIONS**

The rules set forth in this section must be followed but may be deviated from when an **immediate emergency** presents itself that requires such deviation in the interest of safety.

**1. General Operating Rules**

- a. All aircraft in flight within the Airport traffic pattern or in motion or parked on the \_\_\_\_\_ Airport shall operate in accordance with the following rules and regulations and be governed by the current Federal Air Regulations and other Federal and State Aeronautical Regulations as may apply.
- b. Except for emergency landings, the Airport Manager may prohibit aircraft landing and taking off at any time and under any circumstances when he deems such landings and takeoffs likely to endanger persons or property.
- c. In the event the Airport Manager believes the conditions of the Airport to be unsafe (or safe) for landings or takeoffs or if so ordered by the **State pursuant to R.S. 2:6**, the management shall have the authority to issue a NOTAM to close or open the Airport, or any portion thereof.
- d. A minimum of a private pilot's license is required to operate any aircraft from the Airport except for student pilots under the supervision of a licensed flight



instructor. Persons instructing transient student pilots and landing at the Airport will comply with the instructions contained herein.

- e. All flight instructors shall be responsible for the aeronautical conduct of their students.
- f. No aircraft engine shall be started or run unless a competent operator is in the aircraft attending the engine controls. Chocks will be used unless the aircraft is provided with adequate parking brakes which are fully engaged.
- g. No person shall run the engine or engines of any aircraft at any location on the Airport in such manner as to cause damage to other aircraft or property or in such a manner as to blow paper, dirt, or other materials across taxiways or runways in such manner as to endanger the safety or operations on the Airport.
- h. Aircraft engines will be warmed up only in places approved for such purposes by the Airport Manager. At no time will aircraft with engines running or engines being tested be left unattended by any person. At no time shall engines be warmed up or operated when hangars, shops, offices, buildings, persons, equipment, passengers or aircraft landing, parked or taking off are in the path of the propeller stream or jet engine exhaust. Starting of engines shall be prohibited until proper clearance has been ascertained and until all standard safety procedures have been met.
- i. Run-up of fixed wing aircraft will be done at a 45 degree angle to the taxiway or runway with tail toward grass.
- j. No aircraft shall be operated on the surface of Airport,  
  
except Government-owned, that is not fully certificated by and registered with the Federal Aviation Administration, and having either a current Airworthiness Certificate or a Ferry Permit.
- k. No experimental flight or ground demonstration shall be conducted on the Airport without the express approval of the Airport Manager.
- l. No person shall park an aircraft on the public landing area, or the public aircraft ramp and apron area except at such places as may be prescribed or permitted by the Airport Manager. When in such an area, every aircraft shall be adequately tied down. The landing gear of every fixed wing aircraft shall be chocked with wheel blocks or other approved devices. Upon direction from the Airport Manager, the operator of any aircraft shall move said aircraft from the place where it is parked or stored to any other designated place; if the operator refuses to comply with such direction, the Airport Manager may tow said aircraft to such designated place at the operator's expense, and without liability for damage which may result in the course of such moving.
- m. The basing and operation of personal and company-owned aircraft at the Airport shall be by written agreement with the Airport Manager or Fixed Base Operator in each case. If such aircraft are used for hire or other commercial purposes, they are required to have appropriate permits, including an appropriate written agreement with the Airport Authority.
- o. Any person damaging any light or fixture shall report such damage to the Airport Authority office immediately and shall be fully responsible for any costs required to repair or replace the damaged facility.
- q. Any use of available fire equipment must be promptly reported to the Airport Manager so that extinguishers and other items can be serviced without delay.

## 2. Taxiing Rules

- a. No person shall taxi an aircraft until he has ascertained, by visual inspection of the area, that there will be no danger of collision with any person or object in the immediate area.
- b. No aircraft shall be operated in a careless or reckless manner or taxied except at a safe and reasonable speed.
- c. ascertaining that no other aircraft is landing or taking off on the runway. Helicopters will not cross the runway until they are sure that fixed wing aircraft will not be concerned about such crossing.

### 3. Airport Traffic Rules

- a. All activities, which are of an aeronautical nature and all flying of aircraft departing from or arriving at the Airport, shall be conducted in conformity with the current pertinent provisions of these regulations.
- b. All aircraft using the \_\_\_\_\_ Airport will conform to the

following traffic patterns promulgated by the Airport Authority:

- (1) All aircraft in flight below 3000 feet above the surface within a 5 statute mile radius of the center of the \_\_\_\_\_ Airport shall conform to the following rules and \_\_\_\_\_ with the traffic diagrams depicted on the Traffic Pattern Charts included in this Section. No aerobatics shall be performed in **any** of the airspace above the \_\_\_\_\_ Airport or within a radius of 5 miles from the center thereof.
- (2) All aircraft shall fly a **left-hand** (counter- clockwise) traffic pattern when using either runway end or the Public Heliport Touchdown Pad.
- (3) All Aircraft will comply with the guidelines established in the following "Standard Traffic Patterns" section:

#### Standard Traffic Patterns

- (a) Enter pattern in level flight, abeam the midpoint of the runway, at pattern altitude (field elevation + 1000').
  - (b) Maintain pattern altitude until abeam approach end of the landing runway, on downwind leg.
  - (c) Complete turn to final at least 1/4 and not more than 2 miles from the runway.
  - (d) Continue straight ahead until beyond departure end of runway.
  - (e) If remaining in the traffic pattern, commence turn to crosswind leg beyond the departure end of the runway, within 500 feet of pattern altitude.
  - (f) If departing the traffic pattern, continue straight out, or exit with a 45 degree turn beyond the departure end of the runway, after reaching 600' altitude.
  - (g) No more than 4 aircraft may be in the traffic pattern practicing continual touch and go's at the same time.
- c. Rotary Wing Aircraft (helicopters) will utilize the same procedures, except that inbound traffic will maintain 500 feet altitude until commencing their initial approach. Helicopters should avoid the flow of fixed wing traffic and transition to a final approach to the Touchdown Pad on a course parallel to the runway, direction depending on wind conditions.
- d. No aircraft shall take off or land on any taxiway or parking apron, or on any runway other than the active runway or heliport touchdown pad in relation to the direction of the wind. Helicopters should not overfly the fixed wing aircraft

parking apron, but should hover taxi to or from the runway area, remaining clear of fixed wing aircraft.

The active runway (or heliport) shall be determined by the runway (or touchdown pad direction) most closely aligned to the wind as indicated by the airport wind tee. During calm or zero wind conditions all fixed wing landings will be to Runway.

- e. All aircraft taking off shall proceed straight ahead to an altitude of 500 feet above the surface and shall execute the appropriate 90 degree turn when outside the airport boundary.
- f. Aircraft intending to remain in the traffic pattern shall continue to climb to an altitude of 1000 feet above the surface after the first 90 degree turn and shall thereafter follow the pattern as set forth on the attached Air Traffic Chart.
- g. Aircraft leaving the traffic pattern shall climb to a traffic altitude of 600 feet above the surface after making the first 90 degree turn, and shall then leave traffic by doing a 45 degree turn to the west.
- h. Aircraft intending to land at the \_\_\_\_\_ Airport shall fly over the center of the airport at an altitude of 1500 feet above the surface in order to observe the wind direction and other traffic in the traffic pattern.
- i. Aircraft entering the traffic pattern shall exercise caution so as not to cause aircraft already in the pattern to deviate from their course.
- j. All aircraft approaching the \_\_\_\_\_ Airport for landing will call, on the **CTAF frequency (122.8 MHz)**, at least 10 miles out and announce their: intentions, altitude, and direction of flight.
- k. All aircraft maneuvering for landing will call on the CTAF frequency turning cross wind, entering down wind, turning base and on final and when clear of runway.
- l. Departing aircraft will call on the CTAF frequency when taxiing on runway, beginning take-off run with direction of flight.
- m. Aircraft without radio will enter downwind at normal pattern altitude and exercising extreme caution, fly a standard pattern to a landing. At no time, other than an emergency, will a radio aircraft maneuver so as to take right of way from another aircraft already in traffic pattern.
- n. Simulated forced landings are forbidden within the Airport traffic area unless accompanied by a Flight Instructor certified by the FAA or appropriate military authorities.
- o. No aircraft will fly directly over the airport unless landing or taking off, or during an emergency, or to determine wind direction for landing, at an altitude of less than 1,500' MSL.
- p. Rotary-wing aircraft will not operate as to create a hazard to any aircraft.
- q. No aircraft having a single gear wheel bearing loads in excess of 30,000 pounds will be permitted to land on, or take off from the \_\_\_\_\_ Airport except with the prior approval of the Airport Manager, and then only after such approval has been received by the management from the engineering section of the Louisiana Department of Transportation and Development who will calculate potential damage to the airport surfaces by overweight aircraft.

#### 4. Disabled and/or Derelict Aircraft

Upon demand made by the Airport Manager to the owner or operator of any abandoned, disabled or derelict aircraft or parts thereof, wrongfully or improperly left upon airport property, it shall be the duty of said owner or operator to remove the same at his own expense. If after such demand the owner or operator fails or refuses to remove the aircraft within a reasonable time as determined by the Manager from the circumstances

(or condition of hazard created by reason of the presence of such aircraft at such place), the Manager shall cause the same to be impounded and stored. The cost of such removal and storage shall be a charge against the owner or operator of the aircraft and upon the payment of set charge, the impoundment herein provided shall be released and possession of said aircraft shall be restored to said owner or operator. The aircraft must then be immediately removed from the airport premises.

## 5. Damage to Airport

The owner or operator of any aircraft which by reason of any type or accident, crash, or fire, or which by reason of malfunction or operation, causes any damage to airport property shall be responsible to the \_\_\_\_\_ Parish Council, through the Airport Authority, for such damage, and the amount thereof shall be ascertained by the Airport Authority which shall make demand upon said owner or operator for payment thereof. In the event of the failure or refusal of said owner or operator to pay the amount of such claim for damage, a full report of the circumstances on which said claim is based, together with a copy of said claim, shall be turned over to the District Attorney, who shall, when directed by the Airport Authority, institute in the name of said Airport Authority, all necessary legal proceedings for collection of said claim.

## 6. Security of Aircraft

The \_\_\_\_\_ Parish Sheriff's Office makes regular patrol checks of the airport and aircraft tie-down areas in accordance with an agreement with the Airport Authority. However, when, in the opinion of the owner, the kind, type, mission and condition of an aircraft make it necessary to provide additional security guards or policemen wherever the aircraft is located on the airport, the owners of the aircraft shall be responsible for obtaining, providing and maintaining its own security guards or policemen after permission to establish such security has been obtained from the Airport Manager or his duly authorized representative. Security requirements shall not be used as a means to hinder or delay removal of aircraft at the direction of the Airport Manager.

## 7. Stunt Flying - Acrobatics

Except for public displays of aviation flight specifically authorized by the FAA and the Airport Authority to be conducted under responsible auspices and control, violation of any of the following provisions shall be illegal and an offense:

- a. No person shall operate an aircraft in a careless or reckless manner so as to endanger the life or property of others by buzzing, diving or low-altitude flying.
- b. No person shall engage in acrobatic or stunt flying over congested areas or over an open air assembly of persons or below an altitude of 1,500 feet above the surface.

## 8. Free Balloons, Model Aircraft, Parachute Jumping and Air Shows

- a. **Model Aircraft:** No person shall operate or release any model aircraft, rocket, kite, balloon or other similar contrivance at or upon the Airport, nor will any parachute jump be made onto the Airport, without the prior approval of the Airport Manager. Such prohibition shall not include the release of weather balloons when accomplished by a National Weather Service-approved Supplemental Aviation Weather Observer.
- b. **Parachute Jumping:** Federal Air Regulation 105.17 states that:

"unless prior approval has been given by the airport management, no person may make a parachute jump and no pilot in command of an aircraft may allow a parachute jump to be made from that aircraft --

- o over an airport that does not have a functioning control tower operated by the United States; or
- o onto any airport.

However, a parachutist may drift over that airport with a fully deployed and functioning parachute if he is at least 2,000 feet above that airport's traffic pattern and avoids creating a hazard to air traffic or to persons and property on the ground."

A waiver is required on a case-by-case basis from both the FAA and the Airport Authority for all parachute jumping on the \_\_\_\_\_ Airport.

- c. **Air Shows:** No air meets, aerial demonstrations, or other special activities shall be held at the airport unless prior permission and an Air Show waiver is obtained from the FAA and the Airport Manager.
- d. **Special Activity Insurance Requirements:** It is the general intent of the Airport Authority that no such permission shall be granted for special airport activities, including parachute jumping onto the airport grounds, unless the applicant has deposited with the Airport Manager proof of the FAA authorization and either a policy or a certificate of insurance protecting the \_\_\_\_\_ Parish Council, through the Airport Authority, and any third party against loss or damage due to such event and indemnifying the Airport Authority against liability to any third persons resulting there from. This insurance shall be in amounts deemed satisfactory by the Airport Authority.

## D. FUELING AND INFLAMMABLES

### 1. General

No person shall use flammable, volatile liquids having a flash point of less than 100 degrees Fahrenheit in the cleaning of aircraft, aircraft engines, propellers, appliances, or for any other purpose, unless such operations are conducted in open air, or in a room specifically set aside and approved for that purpose; which room must be properly fireproofed and equipped with adequate and readily accessible fire extinguishing apparatus.

The procedures and precautions outlined in the criteria of the National Fire Protection Association (**NFPA Pamphlet No. 410D, Safeguarding Aircraft Cleaning, Painting and Paint Removal** and **NFPA Pamphlet No. 410F, Aircraft Cabin Cleaning and Refurbishing Operations**), will be adhered to in all cleaning, painting and refurbishing operations using flammable fluids, including the storage of such fluids.

### 2. Airport Fuel Dispensing Authorization and Charges

- a. All aviation fuels will be dispensed on \_\_\_\_\_ Airport property only by vendors authorized by the Airport Authority.
- b. No company or individual will be allowed to transport inflammable liquids into any aircraft area or to refuel aircraft on any portion of the property owned by \_\_\_\_\_ Airport, prior to securing authorization from the Airport Authority.
- c. Application for such authorization shall be made to the Airport Authority in writing.
- d. Recipients of fueling authorization issued by the Airport Authority shall adhere to the stipulations set forth and abide by \_\_\_\_\_ Airport Rules and Regulations pertaining to refueling operations.

- e. All holders of permits shall pay whatever flowage fees the Airport Authority establishes from time to time.
- f. The fee for flowage includes all grades of aviation gasoline and jet fuels. Gallonage amounts upon which flowage fee is based will be determined by the Operator's submitting to the Secretary of the Airport Authority, a duplicate invoice from the wholesale vender upon delivery.

### 3. Fueling and Defueling Aircraft

**NFPA No. 407** shall govern the refueling, defueling, oil service and sumping of aircraft, the placing of fuels in storage tanks or dispensers.

- a. No aircraft shall be refueled, defueled or oil serviced while aircraft is being warmed by application of heat, or while the aircraft is in a hangar or congested or an enclosed space.
- b. No person shall smoke or permit any open flame within 100 feet of any aircraft undergoing fuel service or within at least 50 feet from any hangar or building.
- c. Prior to the fuel servicing of any aircraft, it and the fuel dispensing equipment shall be grounded to a point or points of zero electrical potential in the order indicated below and, when complete, disconnected in the reverse order to prevent the possibility of static ignition of volatile liquids.
  - o Aircraft to apron or ground.
  - o Refueling unit to ground.
  - o Refueling unit to aircraft.
  - o Refueling nozzle to aircraft.

This same procedure, modified appropriately, will also apply to defueling, dumping into storage, and filling dispensing equipment.

- d. When a malfunction of refueling equipment is detected, all refueling shall cease immediately and the malfunction remedied or the entire unit replaced by another. Any malfunctions or irregularity detected on or within the aircraft being serviced will be brought to the attention of the aircraft owner or operator immediately.
- e. Personnel engaged in the fueling and defueling of aircraft, the filling of dispensing equipment or dumping storage with aviation fuels shall exercise extreme caution to prevent spills. When spills occur, servicing will cease and spills will be washed down, removed or absorbed with suitable material.
- f. Fueling pumps, meters, hoses, nozzles, fire extinguishers, and grounding devices will be kept in first-class condition at all times.
- g. During fuel handling operations in connection with any aircraft, at least one CO<sub>2</sub> or approved dry chemical fire extinguisher (20 lbs. or larger) shall be immediately available for use in connection therewith.
- h. No person shall perform or allow performance of any refueling operation during an electrical storm.
- i. No person shall operate any radio transmitter or receiver or switch electrical appliances off or on in an aircraft during fueling or defueling.
- j. During fueling or defueling of aircraft, no person shall use any material or equipment which is likely to cause a spark or ignition.
- k. No person shall start the engine of any aircraft when there is any gasoline on the ground under such aircraft.
- l. All hoses, funnels, and appurtenances used in fueling and defueling operations shall be equipped with a grounding device to prevent ignition of volatile liquids.
- m. No aircraft shall be fueled or defueled while passengers are on board the aircraft unless a passenger loading ramp is in place at the cabin door of the aircraft, the

aircraft door is in open position, and a cabin attendant is present at or near the cabin door.

- n. No airborne radar equipment shall be operated or ground tested on any area wherein the directional beam of high intensity radar is within 300 feet, or low intensity radar (less than 50KW output) is within 100 feet of another aircraft, an aircraft refueling operation, an aircraft refueling truck or aircraft fuel or flammable liquid storage facility.
- o. During refueling or defueling, fuel handling vehicles, if used, shall be so placed so as to be readily removable in event of fire so as to permit direct driving away from the loading or fueling position. Not more than one refueler shall be positioned to refuel each wing of an aircraft and not more than two refuelers shall be positioned to serve the same aircraft simultaneously.
- p. Each fuel handling vehicle shall be conspicuously marked in letters of contrasting color, with the word "Flammable" on both sides and rear of the cargo tank in letters at least six inches high, and the wording "Emergency Shut Off" and other appropriate operating instructions required at the emergency operating devices in letters at least two inches high. Each fuel handling vehicle will also be conspicuously marked on both sides and rear with the type and grade of fuel it contains.
- q. Aircraft fuel storage tanks and trucks will be tested for foreign matter and water as follows:

**(1) Aircraft Fuel Trucks**

Operators of aircraft fueling trucks shall establish and adhere to the following sumping procedures.

- (a) At least once each day when a truck is in service, regardless of whether fuel has been dispensed from it during the period.
- (b) Within five (5) minutes after the truck is filled.
- (c) Immediately after a truck is washed and before it is placed in service; and
- (d) Before the truck is returned to service if it has been out of service for maintenance for four hours or more.

**(2) Bulk Storage Tanks**

Persons operating bulk aircraft fuel systems and aircraft fueling trucks on the airport shall adhere to the following procedures:

- (a) Each bulk storage tank containing aircraft fuel shall be tested for the presence of water once a day, and after fuel has been delivered into the tank. If water is present, the quantity shall be measured in centimeters and recorded. Such records shall be retained for 90 days.
- (b) Not more than one inch (1") (2.5 centimeters) shall be permitted in any bulk storage tank containing aviation gasoline.
- (c) No water shall be permitted in any bulk storage tank containing aviation turbine fuel. Any water found in a turbine fuel storage tank (other than in the sump) shall be removed immediately.
- r. All sump fuel samples will be taken in clear plastic or glass containers and at least a quart of sample will be taken. All sump samples shall be emptied immediately after checking in UL approved type safety cans. The safety cans will be emptied at a location approved by the Airport Manager.
- s. Any tank truck found with leaking or faulty sump valves will be taken out of service immediately, and repaired before the truck is returned to service.

- t. Suitable records shall be made of the date, time and results of the sumping test performed on each truck. These records will be retained for 90 days in the airport office of the fuel operator and such record will be periodically checked by the Airport Manager.

#### **4. Storage on Apron Area**

Gasoline, oil and solvent drums or receptacles shall not be stored on apron and ramp areas in excess of amounts actually needed as current stock. Any material of this type that is kept in subject areas will be kept enclosed and covered in a clearly marked and labeled housing of a design and type that meets the approval of the Airport Manager and the State Fire Marshall.

#### **5. Liquid Disposal**

No fuels, oils, dopes, paints, solvents, or acids shall be disposed of or dumped in drains, on the ramp areas, catch basins or ditches or elsewhere on the Airport.

#### **6. Cleaning of Floors**

Floors of any building on the airport shall be kept clean and free from oil. The use of volatile flammable solvents for cleaning floors is prohibited.

#### **7. Fuel, Oil and Solvent Spillage on Airport Surfaces**

Fuel, oil and solvent spillage, left for prolonged periods on black-top surfaces of the outside aircraft parking and servicing areas of the airport, create a serious deterioration condition on this type of pavement. In order to correct this condition, the following procedures shall be placed in effect:

- a. Spillage of oil, kerosene, gasoline, or any solvent, shall be washed away, absorbed, or otherwise "cleaned up" immediately by the responsible person. The use of sand or absorbent materials that can be picked up and blown by aircraft propwash, thus creating an eye hazard, is prohibited.
- b. No aircraft shall be repaired, serviced or degreased on any outside area of the airport not specifically approved by the Airport Manager for such purposes, unless the aircraft is provided with drip pans of sufficient size to catch and contain the product involved.
- c. No repairs, other than those of a minor nature, shall be permitted on any aircraft located on a terminal apron aircraft parking position. When there is a possibility of the repairs creating an oil or solvent spill, adequate drip pans shall be provided.

**Airport Notification:** The Airport Manager shall be notified if the spill is over ten feet (10') in dimension or over 50 square feet in area; continues to flow; or is otherwise a hazard to persons or property.

### **E. GROUND VEHICLES**

#### **1. General**

- a. No person shall operate any motor vehicle on the Airport otherwise than in strict accordance with the applicable Federal, State and Parish laws, codes and other similar regulatory measures, now in existence or as may hereafter be modified or amended.



- b. It shall be unlawful for the operator of any vehicle to ignore or disobey the instructions of any official traffic sign placed in accordance with these regulations unless otherwise directed by a traffic officer.
- c. Any person driving a motor vehicle on the Airport shall operate it in such manner that it is under safe and proper control at all times, weather and traffic conditions considered.
- d. No person shall operate a motor vehicle of any kind on the Airport in reckless or negligent manner, or in excess of the speed limits posted or as prescribed by the Airport Authority.
- e. Unless otherwise posted, no person shall operate any vehicle other than authorized emergency and maintenance vehicles on the Airport at a speed in excess of 25 miles per hour (mph). The maximum speed permitted on the parking ramp aprons is 5 mph.
- f. Pedestrians and aircraft shall at all times have right of way over vehicular traffic. All vehicles shall pass to the rear of taxiing aircraft.  
as to be hazardous to persons or property.  
be maintained at all times when practicable.
- m. Before crossing runways or taxiways, drivers must insure by personal observation that no aircraft is approaching his position.
- n. Emergency conditions existing at any time on the Airport air operations area will not mitigate or cancel these regulations. During such conditions, the driver of any vehicle will make certain that he does not move his vehicle in any direction unless specifically cleared to do so. The Airport Manager or officer-in-charge shall determine when normal operations may be resumed.
- o. The Airport Manager is authorized to install such traffic control signs on the Airport as may be necessary in order to properly control and regulate vehicular traffic.
- p. Any person found to be in violation of vehicular traffic or parking regulations as specified herein may be denied permission to operate a vehicle upon the Airport premises.
- s. All ground vehicles operating on active air operations surfaces must display a checkered flag in accordance with FAA AC 150/5210-5 and/or a yellow flashing beacon.

## **2. Public Automotive Parking**

- a. No person shall park a motor vehicle for loading, unloading or any other purpose on the Airport other than in the areas specifically established for parking, and in the manner prescribed by signs, lines or other means. No person shall abandon any motor vehicle on the Airport. No person shall park a motor vehicle in a manner which would obstruct roadways, nor in aircraft parking areas.
- c. Person or persons found in violation of these regulations pertaining to parking shall be cited for traffic violations under the applicable provisions of Parish Ordinances.
- d. Parking in designated public parking areas is open to all members of the public using the Airport.
- e. All employees of organizations and agencies having tenancy in the airport's building areas shall park private vehicles in the employees' parking lots if provided, or in areas so designated by the Airport Manager or organization/agency.

### 3. **Impounding of Vehicles**

The Airport Manager shall have the right to move and to impound any vehicles parked on Airport premises in violation of applicable rules and regulations. Any such vehicles may be released to the owner or operator thereof upon proper identification of the person claiming it and upon payment of all towing, storage and parking fees. Neither the Airport Authority nor its employees will be liable for damage or theft to the vehicles which might result during the act of removal or subsequent impounding.

## **F. MARKING AND LIGHTING UNSERVICEABLE AREAS INCLUDING CLOSED RUNWAYS AND TAXIWAYS**

Application of the standards and practices contained in **AC 150/5340-1D**, "Marking of Paved Areas on Airports," apply when there is a closed or hazardous area on the Airport or when a deceptive area exists and the Airport Manager determines that an operational need requires such marking.

### 1. **Hazardous and unserviceable parts of the air operations area**

- a. Where a relatively small paved area has failed or for any reason becomes hazardous for aircraft operations and it is not intended to close the entire area to operations, red flags not less than 18 inches square will be used for day marking and red lights or yellow flashing barricade lighting will be used for night marking to delineate the hazardous area.
- b. Where large apron areas are unserviceable, a cross as shown in **FAA Advisory Circular AC 150/5340-1D** will be placed in the center of the unserviceable area. If this type movement area will be used at night, red lights or yellow flashing barricade lights will be used to delineate the unserviceable parts of the area.
- c. On runways or taxiways where the unserviceable area is such as to render the runway or taxiway or portion thereof unusable, red lights or yellow flashing barricade lights will be placed at the entrance to such areas and the runway or taxiway lights in the section will be disconnected and rendered unusable.

### 2. **Closed Airport**

When the entire air operations area is rendered unsafe by a hazardous condition, the field will be declared closed and marked as follows:

#### a. **Day Marking**

A yellow cross will be placed at a central location readily visible from the air in accordance with **FAA Advisory Circular AC 150/5340-1D**, "Marking of Paved Areas on Airports."

#### b. **Night Marking**

All runway, taxiway, and wind tee lights will be disconnected and lanterns or flare pots will be used to outline the day marking cross. The rotating beacon will remain in operation unless the airport is to be closed permanently, in which case the appropriate FAA Regional Director and the Louisiana Department of Transportation and Development should be notified **before extinguishing** the beacon.

### 3. **Required Markings Color**

Aviation yellow will be used for all deceptive, closed, and hazardous area markings.

#### 4. Notifications Required

The Airport Manager will immediately report closed runways and taxiways, airport hazardous areas, and closed airports to the FAA Flight Service Station for NOTAM promulgation and for transmission to the National Flight Data Center (Attention: AT-435) for appropriate action. Such telephone notification should be followed up by **written notification** to the **Flight Service Station**.

#### 5. Safety During Construction

- a. These guidelines apply to all construction work which may affect the movement of aircraft.
  - (1) Prior to the development of contract specifications for construction activity affecting aircraft movement areas, safety requirements relating thereto should be coordinated between the Airport Manager and appropriate representatives of the FAA to determine the restrictions required for the project's Special Provisions, which should result in a minimum of interference to aircraft operations.
  - (2) For construction activity to be performed in other than active operational areas, the storage and parking of equipment and materials when not in use or about to be installed should not encroach upon active operational areas. In protecting operational areas, the minimum clearances maintained for runways will be in agreement with **FAR Part 77**. For taxiways, maintained clearances will not be less than 50 feet from the pavement edge.
  - (3) Open-flame, welding, or torch cutting operations are to be prohibited unless adequate fire and safety precautions have been made and approved by the Airport Manager.
  - (4) Open trenches, excavations, and stockpiled material at the construction site will be prominently marked with red flags and lighted by light units (acceptable to the Airport Manager) during hours of restricted visibility and/or darkness.
  - (5) All vehicles will follow routes and roadways selected by the Airport Manager and stay clear of areas adjacent to NAVAIDS that if traversed could cause emission of false signals or failure of NAVAIDS. These sensitive areas will be identified and clearly marked by the airport engineer.
  - (6) The airport's engineer will identify and mark with yellow flags the location of all utilities in the construction areas that if interrupted, could cause failure of a facility or NAVAID.
  - (7) The Airport Manager will issue the necessary NOTAMs to reflect hazardous conditions. NOTAMs will be kept current and reflect the actual condition with respect to construction situations. Active NOTAMs will be reviewed periodically.
  - (8) Frequent inspections will be made by the Airport's engineer or project engineer during critical phases of the work to insure that the contractor is following the recommended safety procedures.
- b. **Any construction on the airport will be accomplished under the following procedures to insure the protection of the airport NAVAIDS from signal derogation.**

- (1) The Airport Manager, prior to the start of any construction project, will coordinate the construction plans with the FAA and the contractor to insure all airport NAVAIDS will be fully protected during the construction period.  
Contractor must agree that all NAVAIDS in the area of the construction will be provided protection and an appropriate identification chart will be furnished the contractor to insure the required protection.
- (2) The Airport Manager will monitor all construction projects that could affect any airport NAVAID and this inspection will be in addition to any FAA inspections.
- (3) If any airport NAVAID or its operating circuits is damaged during construction, the FAA Automated **Flight Service Station in De Ridder (800-522-3325)** will be notified immediately who will issue any appropriate NOTAM. The Louisiana Department of Transportation, Airway Systems Manager (**225-274-4125**) should also be notified immediately as should the Airport Authority Office who must immediately contact the NAVAID maintenance technician.
- (4) The negligence of a contractor in the protection of a NAVAID will require that the contractor be financially responsible for the required repair, and all construction contracts will contain a provision requiring **immediate** repair or replacement following damage so as not to cause degradation of airport safety.

## G. BIRD HAZARD REDUCTION AND SANITARY LANDFILLS

Periodic checks of the immediate area will be conducted by the Airport Manager to assure that trees and other vegetation areas have not become bird nesting areas.

If such nesting sites are located, proven effective measures must be taken to eliminate the possible hazard this condition would create to operating aircraft. Such measures may include arming personnel with shotguns with authority to kill or drive away the birds. Authority must be requested from the **U.S. Fish and Wildlife Service for a permit** for the destruction of birds as a last resort measure. Under this permit an annual report is required of birds, nests, and eggs destroyed.

Visual surveillance will be maintained by the Airport Manager and during all field inspections. They will be alert for the presence of birds, noting number, common name, and location on the airport. If necessary, an attempt will be made to disperse the birds by the use of horns, sirens, or lights. If these methods are ineffectual, a **NOTAM** will be issued by the Airport Manager or a designated representative advising of the concentration of birds near or on the airport that could be hazardous to the operation of aircraft.

Sufficient copies of **FAA Form 3830**, Bird Strike/Incident, will be maintained in the Airport Authority Office.

During migratory season, special watch will be maintained to detect birds in the Airport area.

The Federal Aviation Administration has published **Agency Order 5200.5**, "FAA Guidance Concerning Sanitary Landfills on or Near Airports," which establishes certain criteria for the evaluation of existing or proposed sanitary landfills in the vicinity of an airport. Basically, a landfill lying within the following area is considered an **incompatible use and potential hazard to the flight of civil aircraft**:

- o 10,000 feet of any runway used or planned to be used by turbojet.
- o 5,000 feet of any runway used only by piston type aircraft.
- o Location places runway or approach/departure surfaces between landfill and bird feeding, water or roosting areas.

**The criteria are not arbitrary.** The dimensional criteria reflect the General operation areas of aircraft utilizing the particular type runway below an altitude of 500 feet, an altitude considered to have the most potential for a bird and aircraft collision.

The Louisiana Department of Natural Resources coordinates permit requests for proposed landfills near airports with the Federal Aviation Administration Airports District Office. FAA and the LA DOTD, Aviation Section may conduct on-site inspections and will object to those proposed landfills deemed as potential hazards to aircraft.

**For guidance in the site selection for landfills,** contact the Department of Natural Resources, Waste Permit Division Administrator.

**Department of Natural Resources**

Office of Environmental Services  
Waste Permit Division  
P. O. Box 4313  
Baton Rouge, LA 70821  
(225) 219-3462

**For assistance in determining possible effect of a landfill in public airport facilities,** contact the Federal Aviation Administration or State Office of Aviation and Public Transportation.

**Federal Aviation Administration**

Southwest Region Headquarters  
Airports Division, ASW-600  
2601 Meacham Boulevard  
Fort Worth, Texas 76137-4298  
Office: 817-222-5640

**Director of Aviation**

Louisiana Department of Transportation & Development  
P. O. Box 94245  
Baton Rouge, Louisiana 70804-9245  
Department of Transportation  
Office: 225-274-4125

U.S. Environmental Protection Agency  
ARIEL Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460  
[www.epa.gov](http://www.epa.gov)

## **H. VIOLATION OF RULES AND REGULATIONS**

## 1. Default on Obligations

When any tenant, user or grantee is formally notified that he is held in default of any written or implied obligation for proper use of \_\_\_\_\_ Parish Airport, whether it

be for breach of performance or service covenants or non-payment, he shall thereafter be billed for all losses of revenue, expenses incurred to re-establish performance or service, and other costs unless the tenant, user or grantee files with the Airport Authority within ten (10) days of receipt of the formal notification a statement that corrective or preventative measures have been initiated and will diligently be carried to completion. If the promises contained in the statement are not fulfilled, the tenant, user or grantee will be considered in absolute default and appropriate legal steps shall be taken.

## 2. Violations

Violation of these rules and regulations shall subject the offender to administrative action as provided below and to legal action by the civil court in accord with **R.S. 2:135(2)** or punishment as provided under Louisiana Criminal Law. A violation of each and every rule, regulation or order shall be considered a separate offense.

Any person who fails or refuses to comply promptly with the rules and regulations contained herein following notice of violation by airport authorities, where such non-compliance interferes with the management, regulation or operation of the Airport and its facilities or creates any hazard or condition which endangers the public or Airport personnel, may be promptly directed to leave the premises of the Airport by the Airport Management. Failure to comply may be considered as either criminal mischief punishable under **Criminal Law R.S. 14:59** or criminal trespass punishable under **R.S. 14:63.3**.

"Any person, firm or corporation convicted of violating any of these rules and regulations except those which constitute Aggravated or Simple Obstruction shall be fined no more than one hundred dollars (\$100.00) or imprisoned for no more than thirty (30) days, or both. On a second or subsequent offense, he shall be fined not more than five hundred dollars (\$500.00) or imprisoned for not more than six (6) months, or both."

**Pursuant to Louisiana Revised Statute 14:96 entitled "Obstructing Highways of Commerce":**

**"Aggravated** obstruction of a highway of commerce is the intentional or criminally negligent placing of anything, or **performance of any act** on any railway, railroad, navigable waterway, road, highway, thoroughfare, **or runway of an airport** wherein it is foreseeable that human life might be endangered.

Whoever commits the crime of **aggravated** obstruction of a highway of commerce shall be imprisoned at hard labor for not more than fifteen years." (Emphasis added)

**R. S. 14:97** stipulates that:

"Simple obstruction of a highway of commerce is the intentional or criminally negligent placing of anything or performance of any act on any railway, railroad, navigable waterway, road, highway, thoroughfare, or runway of an airport, which will render movement thereon more difficult.

Whoever commits the crime of simple obstruction of a highway of commerce shall be fined not more than two hundred dollars, or imprisoned for not more than six months, or both." (Emphasis added)

Such person may also be deprived of further use of the Airport and its facilities for such length of time as may be required to insure the safeguarding of the public interest. Any

person deprived of the use of Airport facilities must apply to the Airport Authority for reinstatement of the privileges of use.

### **3. Enforcement**

The Airport Management, City, Parish, and State uniformed police officers or other representatives as designated by the Airport Authority are empowered to require compliance with these rules and regulations. No authority is either hereby expressed or implied, however, that would permit any individual other than the Parish

Council, through the Airport Authority, to change, alter or amend these rules and regulations, except as provided for in the section of this manual entitled "Emergency Powers of the Airport Management".

### **4. Other Law Enforcement Agencies**

In the event that situations arise that are beyond the capability of regular Airport personnel, outside law enforcement agencies may; be called upon for assistance. Employees assigned by the Louisiana Department of Transportation and Development who have been issued badges and identification cards for such purposes have full authority to require compliance with all of the rules and regulations as set forth in this manual.

# Chapter 15 - Airport Fueling

## Introduction

This chapter covers fuel servicing for aviation, including the following technical areas:

- Types of Aviation Fuel
- Fire Prevention
- Aircraft Fueling Procedures
- Spill Prevention and Protection
- Minimum Inspections
- Recordkeeping

## Types of Aviation Fuel

There are primarily three types of fuel used in aviation today: aviation gasoline or AVGAS, Jet A and automotive gasoline or MOGAS. Jet A is often mixed with an anti-bacterial/anti-icing agent. Many smaller, GA airports choose to order the Jet-A premixed with this additional agent.

### *Aviation Gasoline*

Aviation gasoline, normally referred to as AVGAS, is highly flammable and extreme care should be used when fueling with this type of fuel. The term AVGAS is usually followed by the description of the grade number that was recognized by all commercial and military specifications. AVGAS can be identified by a colored dye that is mixed for easier identification. The grade of AVGAS used today is 100LL, which has a blue dye mixed for easier identification. The number “100” refers to the octane rating for aviation fuel and the “LL” refers to “Low Lead” content in the fuel.

Usually tanks or trucks which contain AVGAS are labeled with white letters and numbers printed on red backgrounds. The red background was chosen to highlight the fact that extreme care should be taken when handling this volatile fuel type.

### *Jet A*

There are two types of Jet A fuel normally used for aircraft fueling: Jet A and Jet A-1. These two types of Jet A fuels are basically the commercial grade kerosene. These jet fuels are used in turbojet and turboprop aircraft engines. Jet A fuels do not have much higher flashing points than AVGAS, thus making them less flammable than AVGAS. However, as with all fuel types used, extreme care and caution should be exercised when fueling and handling these materials.

The two Jet A fuel types and their freezing points are identified below:

- Jet A      Jet A kerosene having a -40° F freezing point.



- Jet A1 Jet A-1 kerosene similar to Jet A but has lower temperature characteristics. This type has a freezing point of -53° F

Jet A fuel trucks and tanks are usually painted in white letters with black backgrounds designating the fuel types. Normally hoses and piping containing Jet fuels are painted or taped with colored circular bands. For instance one 4-inch (minimum) black band is used to identify Jet A fuel and two 4-inch bands are used to identify Jet A-1 fuel.

### ***Automotive Gas***

Certain automobile gasoline may be used in aircraft engines as a replacement for AVGAS. The use of automobile gasoline may be used if a Federal Aviation Administration (FAA) Supplemental Type Certificate (STC) has been obtained for the aircraft. Automobile gasoline used for aircraft engines is commonly referred to as MOGAS. The grade type and performance number established under all commercial and military specifications usually will follow the term MOGAS.

No color coding system has been established for identifying fuel trucks, tanks, fuel line hoses or piping which contains automobile gasoline.

## **Fire Prevention And Safety**

A clean and orderly facility is a first essential step for fire and accident prevention. Regardless of the cause, almost all fires can be prevented or controlled. The facility operator should be familiar with the more common causes of fires. Before a fire can occur, three things are necessary to produce fire: fuel in the vapor form; air (oxygen); and a source of ignition. Two of these are normally present during fueling operations or at a spill. Fuel in the form of flammable vapors is present because all aviation fuels vaporize to some degree, even at low temperatures. Therefore, it is important to control all sources of ignition where there are vapor-air mixtures. All employees involved in aircraft fuel servicing operations should be trained in fuel servicing operations, firefighting methods, the use of fire extinguishers, and be made aware of the potentially dangerous conditions associated with flammable liquid fires.

### ***Ignition Source Control***

Smoking obviously should be prohibited in the fueling area. Smoking should be permitted only in safe, designated areas away from ramps, hangars, aircraft, and fueling equipment. “No Smoking” signs should be posted throughout areas where flammable liquids and flammable liquid vapors are normally present.

Heating and electrical equipment should be located away from fueling areas as much as possible. Heating equipment should be located so that it would not be exposed to normal flammable vapors. Electrical equipment should be maintained in accordance with local regulations and any part of the electrical system or equipment installed or used in areas where fuel or its vapors could be present should be of approved explosion-proof design. Power equipment such as mowers,

electric drills, grinders and other possible spark producing power equipment should not be operated in areas where tanks are being filled by pumping or when the tanks are being ventilated or cleaned.

Trucks should be electrically bonded to the loading rack piping by means of a bonding cable during loading operations to minimize sparks from static electricity. Fuel handling personnel can sometimes cause static electrical build-up as a result of the clothing they are wearing. The combination of a wool sweater and a nylon jacket will produce static. The use of taps or hobnailed boots should not be permitted around fuel.

Waste paper, packing material, and oily or paint rags can be a ready fuel source for an accidental fire. Adjacent areas of dry grass and weeds can also spread an accidental fire from its source. Good housekeeping such as placing all waste paper and rags in covered metal containers and emptied daily is essential in reducing ignition sources. No barrels or drums, empty or full, and no combustible materials should be permitted within at least 10 feet from any storage tank. Elimination of grass and weeds will minimize the spread of outside fires into adjacent areas.

### ***Vapor Control***

When volatile flammable liquids are exposed to air, a combustible mixture may be formed. Flammable vapors released during fueling are heavier than air. Transferring these liquids to an open container releases vapors into the air and whenever possible should be avoided.

When filling a fueling truck, bottom loading is preferred. During top loading, the use of extension spouts in order to deliver fuel to the bottom of the tank reduces the amount of vapors released. All valves, pumps, and flanges should be maintained in leak-proof condition so as to minimize leaks and spills. In the event of a major spill or overflow, all operations in the vicinity should stop until the area has been made safe. Spill prevention and control are discussed later in this chapter.

Here are other safety concerns:

- No heating equipment should be located in the area where they may contact flammable vapors.
- All power equipment should not be permitted to operate in areas where flammable vapors may be present.
- All trucks should be electrically bonded (grounded) using bonding cable to minimize possible sparks from static electricity.
- All aircraft being fueled should be electrically bonded (grounded) using bonding cable to minimize possible sparks from static electricity.

- Clothing worn by fuelers should not be susceptible to produce static electricity (such as wool, nylon, etc.).
- All electrical cords, circuits and fuses in the area should be maintained in premium condition.

### ***Equipment Marking***

All airport equipment should be marked to identify the type of grade of aviation fuel being dispensed in order to prevent intermixing or contaminating fuels. All airport fueling systems shall be marked according to the detailed marking codes in the Federal Aviation Administration (FAA) Advisory Circular AC 150/5230-4 "Aircraft Fuel Storage, Handling, And Dispensing on Airports". Particular attention should be given to the marking of fueling vehicles, fuel lines, pumps, and valves used for the loading and unloading of fuel.

## **Aircraft Fueling Procedures**

### ***General Fueling***

Written standard operating procedures (SOP) for aircraft fueling should be available in each fueling truck and also in the airport manager's office. These procedures should include all safety requirements of the National Fire Protection Association (NFPA) Standard 407 and the particular petroleum company's standard. A typical fueling procedure is outlined below.

1. In order to service the aircraft promptly and efficiently upon arrival the fueler should obtain as much advance data as possible, including:
  - Arrival and departure times.
  - Quantity and grades of product required (fuel, oil, etc.).
  - Fueling method (hydrant, refueler, overwing, single-point).
2. Upon aircraft arrival, obtain quantity and grades of products required from airline or aircraft personnel.
3. The aircraft should not be approached until it has come to a complete stop, the engines have been shut down, and it is ready for servicing.
4. The fueling vehicle should be positioned with a clear path to permit its rapid removal after fueling is completed or in the event of an emergency. Consideration should be given to the location of the fueler's engine and location of the aircraft's fuel vent system. The fueling vehicle must not be positioned where it would obstruct aircraft exits and loading areas. Always chock the truck's wheels and set the emergency brake after the vehicle is in position.
5. All fueling operations must be conducted outside of hangars or enclosed buildings.

6. After the fueling vehicle is in position, fire extinguishers must be readily available in accordance with NFPA standards.
7. Attach a grounding cable from the fueling vehicle to a satisfactory ground connect. Connect a grounding cable from the ground to the aircraft fitting, if available, or any convenient unpainted metal point on the aircraft. Bond the vehicle to the aircraft. Bonding and grounding requirements and electrical continuity checks shall be in accordance with applicable NFPA standards.
8. Hoses should be run out on selected routes which will prevent them from being run over by servicing vehicles or obstructing passenger access to and from the aircraft. Kinking and twisting of hoses should be avoided. Pressure fueller couplings and overwing nozzles should not be dragged over the ground. Dust caps should be in place at all times when pressure coupling and nozzles are not in use.
9. Before fueling, check with the aircraft representative to confirm that all pertinent equipment on the aircraft is positioned ready to receive fuel.
10. If fueling is performed at night, the fueling area should be well lit.
11. No fueling should be conducted during any aircraft maintenance that might provide a spark or source of ignition of fuel vapors. All radio and radar equipment in the aircraft must be "OFF" and switches must not be manipulated.
12. If an aircraft is fueled with passengers on board, an aircraft representative should be on board to ensure that "No Smoking" rules are observed.
13. While under fuel flow, check vehicle and fuel system for leaks, and observe that the filter pressure differential does not exceed acceptable limits. If leaks or signs of leaks occur, all fueling operations must stop immediately.
14. Flow rate for fuels with flash points below 100°F should be reduced to decrease static electricity build up.
15. The operator should be positioned at a point where there is a clear view of the vehicle control panel and aircraft fueling points. Deadman controls must always be used and never wedged or blocked open; this defeats their purpose.
16. "NO SMOKING" signs should be displayed in prominent positions near the aircraft and on the fueling vehicle.
17. Unauthorized persons should not be permitted in fueling area under any circumstances.

## ***Underwing (Single-Point) Fueling***

The basic fueling procedures for underwing fueling are as follows:

1. Ground and bond the fueling vehicle to the ground and to the aircraft.
2. For hydrant services only:
  - Open hydrant pit cover (check product grade before connection).
  - Place "WARNING" signs or lights in position at hydrant box.
  - Remove dust caps from valve in hydrant box and from coupler of inlet hose.
3. Open aircraft fueling station access door and remove dust covers from hose nozzle and aircraft valves.
4. Connect delivery hose to aircraft fueling point, open nozzle, place appropriate aircraft fuel switch to the "ON" position, connect the hose coupler to the hydrant valve after checking both valve surfaces to be sure they are clean and dry, then activate fueling vehicle with deadman control.
5. Start fueling -- keep alert and take all precautions for safety and be sure not to exceed aircraft structural fuel pumping pressure.
  - Continually monitor the underwing fuel gages and be in a position to quickly shut off flow in an emergency.
  - Never block a deadman control in the "ON" or open position. Under no circumstances should the nozzle be left unattended during fueling.
6. Never overlook the possibility of an accidental fuel spill or leak from the aircraft or the fueling vehicle.
7. Upon completion of fueling:
  - Check fuel quantity that was dispensed with the fuel quantity requested.
  - Disconnect hydrant coupler and put away hoses.
  - Disconnect hose nozzle and replace dust caps and aircraft fuel caps.
  - Remove ladders or lower platform.
  - Remove bond cable from aircraft to fueling vehicle and ground cable from ground to fueling vehicle.
8. Check the filter/separator sump or the fueling vehicle for water following fueling.
9. Remove fueling vehicle from aircraft area as soon as possible after servicing is complete.

## ***Overwing Fueling***

Overwing fueling is the most common type of fueling for general aviation.

In addition to the procedures for underwing, where applicable, the following should also be applied.

1. Always use suitable ladders and mats to avoid damaging the aircraft's wing. Use extreme care to prevent the hose or nozzle from damaging the de-icer boot, leading edge of wing, or aircraft skin.
2. Set wing mat in place.
3. Connect static bonding wire from nozzle to receptacle, post, or other metal part of the aircraft before opening fuel tank cover.
4. Open tank access, remove nozzle dust cap and insert nozzle, keeping a constant contact between the nozzle and the filler neck while fueling.
5. Start fueling -- Overwing nozzles should not be equipped with the "hold open ratchets" which will prevent the nozzle from being unattached during delivery. Make frequent visual checks of tank capacity, taking extreme care to prevent spillage or overfilling.
6. Upon completion of delivery, the quantity in tank should be checked with fuel quantity requested. Replace and secure tank access cap. Disconnect nozzle static bond wire. Replace nozzle dust cap.
7. Return hose to fueler reel.

### ***Defueling Procedures***

Defueling an aircraft may be necessary for a load adjustment or maintenance work. The safety procedures are similar to those used in fueling. In making a load adjustment, defueling normally follows after the aircraft has been fueled. Defueling for maintenance work will normally require the aircraft tanks to be emptied.

The defueled product should be held in the defueling unit and returned to either the aircraft from which it was removed, or to other aircraft using the same fuel type. However, if the fuel is known or suspected of being contaminated, has an unknown grade of fuel or mixtures, or if the fuel was removed due to an accident or other unusual circumstances, then the defueled product that is withdrawn should be emptied into an empty refueler and handled as contaminated fuel and **not** returned to any aircraft.

# Spill Prevention, Protection And Clean Up

## *Preventing Spills And Overfills*

Because human error causes most spills and overfills, these mistakes can be avoided by following correct tank filling practices. First make sure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made. Second, make sure that the transfer operation is watched constantly to prevent overfilling and spilling. Third, use equipment that can prevent or severely limit spills and overfills.

Spill prevention devices, such as spill catchment basins or dry disconnect couplings, are readily available. Overfill prevention devices automatically shut off flow when the tank is nearly full. Other overfill devices either restrict flow or trigger an alarm when the tank is nearly full.

## *Spill Response Plan*

Spills and leaks of fuel present extremely hazardous situations. Because there are many different ways a fire can be started, extreme care should be given and a prompt response should always be used when a spill occurs. One of the single most important safety documents an airport manager can have is an effective spill response and clean-up plan. All spill response plans should be made readily available to all tenants, pilots, fuelers, and any other personnel that may come in contact with fuel spills.

The spill response plan should describe:

- Identification of a spill response “team” responsible for implementing the plan.
- Appropriate safety measures.
- Procedures to notify appropriate authorities providing assistance (fire, police, hospital, spill response contractor, etc.).
- Spill containment, diversion, isolation, and clean-up procedures.
- Spill response equipment, including:
  - Safety equipment such as fire extinguishers, protective clothing, two-way radios, respirators, etc.
  - Clean-up equipment such as booms, barriers, sweeps, absorbents, containers, etc.

Each spill is different, therefore no one set of instructions will apply in every case. If fuel is discovered spilling from fuel service equipment or from the aircraft itself, the fuel servicing shall be stopped immediately by the release of the deadman control or by operation of the emergency fuel shutoff. Every spill, no matter how small, should be reported immediately to the supervisor and cleanup actions taken. Pint size spills do not require emergency action.

### Spills From 18 Inches To 6 Feet In Any Direction

Any fuel spill presents a potential fire hazard. A minimum protection for this size spill would be to post a person to guard and maintain a restricted area around the spill and to keep out unauthorized persons. This guard should be equipped with at least one 15-pound dry chemical or carbon dioxide extinguisher. This spill should be cleaned up as quickly as possible with absorbent cleaning agents, emulsion compounds, or rags. Contaminated absorbents and fuel-soaked rags should be placed in metal containers with self-closing lids until burned at a safe location or otherwise disposed of properly.

### Spills Over 6 Feet In Any Direction Or Of A Continuous Flowing Nature

These spills are extremely hazardous. The airport emergency fire crew should be called at once. If an emergency crew is not available, airport personnel should mobilize all available firefighting equipment as standby protection. The equipment and assistance of other fire protection units should also be requested. Large spills of gasoline and Jet B fuel (JP-4) should be blanketed with foam. The spill should then be washed away with water and any residue allowed to evaporate before the area is used again. These spills should not be washed down sewers or drains. If such an action occurs, it should only be on the orders from the chief of the fire department. If any spillage should reach the sewers, the sewers should be thoroughly flushed with water. Any fuel that is flushed into the storm water system should be collected before it enters a natural waterway. Any fuel spillage recovered should be disposed of properly.

Every spill should be thoroughly documented describing the date, location, amount, and reason for the spill. Also, procedures used to clean up the spill, personnel mobilized and corrective actions taken as a result of the spill should also be documented.

Local environmental regulations, in particular the National Pollutant Discharge Elimination System (NPDES), must be considered. Each airport has different drainage routes that may affect how spills are cleaned-up. These situations should also be considered when developing effective spill response plans.

## **Minimum Inspections**

At an aircraft fuel servicing facility every possible precaution must be taken to prevent contamination of the fuel tanks and piping by solids, water and other products. Daily handling procedures should be designed to reveal any problems or equipment malfunctions or any other conditions that might need corrections. An airport fuel servicing facility should have some MINIMUM inspections that would occur on a daily, weekly, and monthly basis. These inspections should not only cover all fueling equipment, but should also include safety and inventory control items as well. Additional inspections of aircraft fueling vehicles are also included.

### ***Daily Inspections***

The following items should be checked daily and corrective actions taken as necessary:



1. Check the bottoms of all storage tanks for water using a water drawoff connection for above ground tanks or thief pump for underground tanks. A visual test, or a water finding paste on a gauge stick or tape should also be performed.
2. Check manual water drains of filters for and other contaminants before and after each receipt of product and after a heavy rainfall. Draw off any accumulation of water and dispose of water properly.
3. Check and record filter, filter/separator, and contaminant monitor (if applicable), and also check differential pressure while operating flow conditions.
4. Check and record the fuel quantity in each storage tank.
5. Check all mobile refuelers for proper operation, fuel contamination and filter operation.

### ***Aircraft Fueling Vehicles***

1. Check both the truck engine and auxiliary pumping engine fuel, oil, and radiator levels, battery water levels and record any added amounts, and check for leaks.
2. Check the fire extinguishers to see if they are in place, filled and are operable.
3. Check to see if the static strap is in contact with the ground.
4. Check to see that the fuel marker signs are in place.
5. Make a fuel color check to see that the fuel marker signs agree.
6. Check the entire length of all hoses for cracks, cuts, or breaks. Remove, inspect, and clean the hose nozzles and strainer and comment on any impurities found. Be sure the nozzle spout cap is in place.
7. Check the refueler truck engine exhaust piping for leaks and cracks and make sure the muffler flame arrester for leaks and noise.
8. Make sure the engine shrouding is secure and in place.
9. Check the engine exhaust piping for leaks and cracks.
10. Check all tank drain samples for water and drain until free of water.
11. Check all separators for water and drain until free of water.
12. Check all emergency valves for proper operation of controls.

### ***Weekly Inspections***

The following items should be checked weekly and corrective actions taken as necessary:

1. Check and clean all strainer baskets. If breaks are found in basket, it must be repaired or replaced.
2. Check and clean screens in all bottom loading and other hose nozzles. If breaks are found, the screen must be repaired or replaced.
3. Visually inspect all hoses for abrasions, separations, or soft spots. Damaged or deteriorated hoses must be replaced.
4. Check the storage tank floating suction and test cables, where applicable, for freedom of operation.

### ***Aircraft Fueling Vehicles***

1. Check the vehicle battery water level. If water is required, service each cell to the full mark.
2. Check the condition and appearance of the vehicle. Check for broken and missing window glass, damage to interior and exterior surfaces, missing panel doors, etc. Assure that there are non-skid pads on the brake and clutch pedals and they are in serviceable condition.
3. Check that the contents of the vehicle are prominently displayed. Assure that there are at least two product identification placards ("JET A" or "AVGAS," etc.) on each side of the vehicle. The placards must be legible and the letters should be at least three inches high on a background of sharply contrasting color. Check that there are at least two "FLAMMABLE" placards prominently displayed on the vehicle. The placards must be displayed on two sides or on the front and rear bumpers. The placards must be legible and the letters should be at least three inches high and on a background of a sharply contrasting color.
4. Check the condition and operation of fuel tender compartment dome covers, cover gasket, and tank compartment vents.
5. If the vehicle is so equipped, check that the proper aircraft sumping drain tools are all in serviceable condition.
6. Check the condition of ladders or approached metal steps. If unserviceable, tag, remove from vehicle, and replace. Wooden boxes, milk cases, etc. are NOT approved for use while fueling aircraft.

7. Check the general condition of the vehicles electrical system and wiring. Check for broken conduit, bare wires, missing junction box covers, and other discrepancies. If applicable, assure that there is a cover over the battery and it is properly installed.
8. Check the condition of the vehicle plumbing, valves, and gauges in the pumping station. Check for leaks, proper operation of all valves, gauge faces, and any other discrepancies.

### ***Monthly Inspections***

The following items should be checked monthly and corrective actions taken as necessary:

1. Check the lubrication and the oil level (in those pumps equipped with a gear box) of the pumps, motors, hose reels, and other machinery requiring lubrication. For those reels and lubricated valves, use lubricants that will not clog fuel screens in aircraft system at all aircraft operating temperatures. Make sure the correct seasonal grade of lubricant is used.
2. Check the action of all valves.
3. Check the condition and electrical continuity of the static grounding clips, wires, and bonds at the loading racks, pits, and other points, of fuel transfer.
4. Inspect all fire extinguishers for broken seals, proper pressure, and recharge date. Recharge as necessary.

### ***Demand Inspections***

The following items should be checked on a demand basis and corrective action or maintenance performed as necessary:

1. Check the entire fueling facility to see that all aspects of the product identification system are marked clearly and correctly.
2. Conduct a check of the cleanliness level of jet fuels discharged at the downstream side of the filter/separator. Conduct a check of monitoring devices as required by the manufacturer.
3. Conduct a thorough inspection of all mobile refuelers.

## **Recordkeeping**

Proper recordkeeping such as documenting all fuel spills, inspections, and maintenance activities are essential elements in the safe and efficient operation of an aircraft fuel servicing facility. All fueling operators should develop and maintain (for at least a period of 12 months) adequate records.

The records should show at least the following information:

1. Source, tests run on, and ultimate delivery point of all fuel brought onto the airport.
2. Checks, and any corrective action taken, made on equipment required for aircraft fuel servicing.
3. Training given and qualifications/achievements of all fueling staff on the airport.
4. Records of all significant (release in excess of the Environmental Protection Agency's "List Of Hazardous Substances And Reportable Quantities") fuel spills and leaks describing:
  - Whether the incident was a spill or leak
  - Date of incident
  - Location of incident
  - Type of material spilled or leaked
  - Quantity of material spilled or leaked
  - Source (if known) of spill or leak
  - Reason for spill or leak
  - Amount of material recovered as a result of cleanup efforts
  - Preventive measures taken during cleanup for safety and environmental concerns

These records, as with all records, should be made available for inspection by the airport operator or the Federal Aviation Administration upon request.

## References

Federal Aviation Administration, "Fuels and Agents".

Federal Aviation Administration, "All About Fuel".

Federal Aviation Administration Advisory Circular AC 00-34A, "Aircraft Ground Handling and Servicing".

Federal Aviation Administration Advisory Circular AC 20-43C, "Aircraft Fuel Control".

## **APPENDIX A**

# **Consultant Selection Procedure Documents**

**CONSULTANT SELECTION COMMITTEE FORM**

I accept my appointment by the \_\_\_\_\_ to its Consultant Selection Committee.  
(airport sponsor)

As a member of the Consultant Selection Committee, I will adhere to the principles of a fair and open consultant selection process based on the competence and qualifications of firms.

Neither I nor my employer will directly or indirectly compete for the services or perform the services required under this consultant selection process.

I am aware of the Federal, State, and Local requirements for the selection of consultant services and will conduct this committee's work according to its procedures.

Signed: \_\_\_\_\_

Print Name: \_\_\_\_\_

Employed by: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## STATEMENT OF QUALIFICATIONS (SOQ) RATING SHEET

**APPLICABILITY:** to be used by the Consultant Selection Committee in evaluating the qualifications received via the submittal of a Standard Form 330. A rating sheet should be completed for each SF 330 received by the committee.

Name of Committee Member: \_\_\_\_\_

Name of Firm Being Rated: \_\_\_\_\_

PART I				
SECTION A		CONTRACT INFORMATION		
Criteria	Yes	No		
1. Title and Location				
2. Public Notice Date				TOTAL SCORE (Pass/Fail)
3. Solicitation or Project Number				

SECTION B		ARCHITECT-ENGINEER POINT OF CONTACT		
Criteria	Yes	No		
4. Name and Title				
5. Name of Firm				
6. Telephone Number				
7. Fax Number				TOTAL SCORE (Pass/Fail)
8. Email Address				

SECTION C		PROPOSED TEAM		
Criteria	Yes	No		
Prime Firm				
Joint-Venture Firm ( <i>Use N/A if not applicable</i> )				
Subconsultant(s) ( <i>Use N/A if not applicable</i> )				TOTAL SCORE (Pass/Fail)

SECTION D		ORGANIZATION CHART OF PROPOSED TEAM		
Criteria	Yes	No		TOTAL SCORE (Pass/Fail)
Attached organization chart				

SECTION E RESUMES OF KEY PERSONNEL FOR THIS PROJECT				
Criteria	Rating		Weight	TOTAL SCORE
Overall Experience of Key Personnel Proposed for This Contract		x		=

SECTION F EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT				
Criteria	Rating		Weight	TOTAL SCORE
Project #1				
Project #2				
Project #3				
Project #4				
Project #5				
Project #6				
Project #7				
Project #8				
Project #9				
Project #10				
Average Rating		x		=

SECTION G KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS				
Criteria	Score		Weight	TOTAL SCORE
Project #1				
Project #2				
Project #3				
Project #4				
Project #5				
Project #6				
Project #7				
Project #8				
Project #9				
Project #10				
Average Rating		x		=



SECTION H		ADDITIONAL INFORMATION				
Criteria	Rating		Weight		Score	
		X		=		
		X		=		
		X		=		
		X		=		
		X		=		
<b>TOTAL SCORE (sum of all scores in Section H)</b>						

PART II			
ALL INFORMATION			
Yes	No		TOTAL SCORE (Pass/Fail)

OVERALL SCORE OF FIRM	
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## **Statement of Qualifications Rating Worksheet**

**Applicability:** to be used in conjunction with the LA DOTD Statement of Qualifications Rating Sheet and the Standard Form 330 (SF 330) Part I for the selection of consultants by a Qualifications Based Selection process. This worksheet provides guidance to the Consultant Selection Committee (CSC) on evaluating the qualifications received in the SF 330 and will aid the CSC in completing the Statement of Qualifications (SOQ) Rating Sheet.

Adherence to the LA DOTD Aviation Consultant Selection Process will ensure compliance with all applicable Federal Aviation Administration regulations and requirements regarding procurement of professional services, and is required for any proposed contracts with LA DOTD receiving funding from the Aviation Trust Fund.

### **Key Terms:**

- **Consultant Selection Committee (CSC):** a committee formed by the airport sponsor, in accordance with LADOTD policy, for the purpose of selecting a consultant firm when the airport sponsor is seeking FAA or LADOTD Aviation funding for eligible airport projects.
- **Qualifications Based Selection (QBS) Process:** a process by which a firm is selected according to its qualifications as opposed to a fee-based selection process. In the QBS process, fees are only discussed after the top firm is selected and is done through a fee negotiation process.
- **Rating:** how well a firm rates for a particular data item on a scale of 1 to 5, with 1 being the lowest and 5 being highest.
- **Standard Form 330 (SF 330):** a form used by Federal agencies to receive statements of qualifications when procuring professional services, which is authorized for local reproduction. LADOTD Aviation Section has chosen this form for use by airport sponsors when selecting consultant firms for projects eligible for FAA or LADOTD Aviation funding.
- **Statement of Qualifications (SOQ) Rating Sheet:** a rating sheet developed by LADOTD Aviation Section to enable the CSC to rate the qualifications of each firm submitting a SF 330 for a proposed contract. This SOQ Rating Sheet is to be used to develop a short list of firms from which the CSC will receive proposals through the Request for Proposals (RFP) process.
- **Weight Factor:** a factor of importance assigned to each Section of the SOQ Rating Sheet. The average rating for each Section is multiplied by that Section's Weight Factor in order to determine the firm's score for that Section (i.e., if the average rating for a Section is 7, and the Weight Factor for that Section is 3, then the Overall Score is 21 (7 x 3 = 21)).

## **PART I**

The qualifications provided in Part I of the SF 330 are specific to the contract(s) that the sponsor is seeking to procure.

### **SECTION A            CONTRACT INFORMATION**

The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. Each data item must be fully completed in order to be marked “yes”. Any incomplete data items must be marked “no”. If an evaluator indicates “no” to any of the data items requested, the deficiencies must be discussed by the CSC as a whole to determine if the firm is considered satisfactory or not.

The information in this Section is scored as pass or fail. Any data items receiving a “no” mark may be considered incomplete and may cause a firm to receive an overall score of “Fail” for this Section.

### **SECTION B            ARCHITECT-ENGINEER POINT OF CONTACT**

The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. Each data item must be fully completed in order to be marked “yes”. Any incomplete data items must be marked “no”. If an evaluator indicates “no” to any of the data items requested, the deficiencies must be discussed by the CSC as a whole to determine if the firm is considered satisfactory or not.

The information in this Section is scored as pass or fail. Any data items receiving a “no” mark may be considered incomplete and may cause a firm to receive an overall score of “Fail” for this Section.

### **SECTION C            PROPOSED TEAM**

The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. Each data item must be fully completed in order to be marked “yes”. Any incomplete data items must be marked “no”. If an evaluator indicates “no” to any of the data items requested, the deficiencies must be discussed by the CSC as a whole to determine if the firm is considered satisfactory or not.

Joint-venture firms and sub-consultants may or may not be required, depending on whether or not the prime firm can meet all of the requirements for the technical disciplines established in the criteria. If no information is received for Joint-Venture or Sub-Consultant firms, those items may be marked as “N/A”; however, Section C of the SF 330 should be reviewed carefully by the evaluator to ensure all key personnel meet the technical discipline requirements of the Selection Criteria. If

not all technical disciplines are met by the Prime Firm, then the absence of information for Joint-Venture or Sub-Consultants may result in those data items being marked “no”.

The information in this Section is scored as pass or fail. Any data items receiving a “no” mark may be considered incomplete and may cause a firm to receive an overall score of “Fail” for this Section.

#### **SECTION D ORGANIZATIONAL CHART OF PROPOSED TEAM**

The evaluator should check to ensure the firm has provided an organization chart showing the names and roles of all key personnel listed in Section E and the firm they are associated with as listed in Section C. The chart should provide a clear picture of the working relationship between all key personnel on the proposed team.

#### **SECTION E RESUMES OF KEY PERSONNEL FOR THIS PROJECT**

12 – 18. The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. The evaluator should then review the experience, education, and professional qualifications provided for each key personnel proposed for the contract to ensure that the individuals listed are qualified for the project(s) planned by the airport.

19. The evaluator should review the projects listed, which should contain projects in which the individual had a significant role and demonstrates the individual’s capabilities in providing the required level of service for the airport’s proposed projects. These projects do not necessarily have to correspond to the projects listed in Section F, but it should be noted in the appropriate check box if the project was done with the firm to which the individual currently belongs.

**Section E is the first Section of the SOQ Rating Sheet that is scored by a numerical value. An overall score of 1-5 (5 being the highest, 1 being the lowest) should be assigned to Section E after the evaluator has reviewed all resumes of key personnel and determined the value of the experience of the proposed team as a whole.**

#### **SECTION F EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM’S QUALIFICATIONS FOR THIS CONTRACT**

21-23. The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. The CSC should contact the owner of each project listed at this point in the selection process for a brief evaluation of the firm’s performance.

24. The evaluator should review the project description to determine its relevance to the projects being planned by the airport.

25. For each project, the evaluator should review the list of firms and the information provided with each and compare to firms listed in Section C. While it is not necessary for all firms listed for a project to correspond to Section C, the most important roles in each project should have been performed by firms in the proposed team listed in Section C.

Each project should be scored individually, with the overall score being derived from the average of all project scores in Section F. This score should be based on how well the example project demonstrates the firm's ability to perform the projects being proposed by the airport in the Request for Qualifications.

**\*\*NOTE:** if the firm has not provided the number of example projects requested by the CSC in the Request for Qualifications, then a score of 0 (zero) will be assigned to each project line left blank up to the requested amount of projects (i.e. if 7 projects are requested and only 4 provided, then projects #5 through #7 shall receive a score of 0)

## **SECTION G**                      **KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS**

26-29. The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. The evaluator should then review the list of key personnel listed for each project as well as the role each individual performed in the project.

29. The evaluator should score each project based on the participation of key personnel, and by comparing key personnel's role in that contract with their role in the proposed contract.

**\*\*NOTE:** If the firm has not provided the number of example projects requested by the CSC in the Request for Qualifications, then a score of 0 (zero) will be assigned to each project line left blank up to the requested amount of projects (i.e. if 7 projects are requested and only 4 provided, then projects #5-#7 shall receive a score of 0).

## **SECTION H**                      **ADDITIONAL INFORMATION**

30. The evaluator should check for the completeness, general accuracy and reasonableness of all information provided. Section H of the SOQ Rating Sheet provides for the CSC to list additional criteria not mentioned in Sections A through G of the SOQ Rating Worksheet.

The data items listed in Section H should consist of additional criteria that the CSC feels are necessary for the proposed contract and reflect a particular need or needs not addressed by the Standard Form 330 Part I. Information on a firm's principal, business licenses and permits, information typically requested by auditors, and other pertinent info are examples of items to include in this Section. The CSC may use either a "Pass/Fail" or numerical rating scale for Special Criteria. A weighing factor should be applied to each separate Special Criteria.

Detailed criteria, such as proposed scope of services, technical approach descriptions, proposed schedules, presentations, and detailed proposals in general should be requested in the Request for Proposals stage of the Consultant Selection process rather than in Section H of the State of Qualifications

In order to include Special Criteria in the Request for Qualifications, the CSC must first complete the LA DOTD Aviation Special Criteria form and include it in the First Document Transmittal.

## **PART II**

The qualifications provided in Part II of the SF 330 are the general qualifications of each firm/branch office that will be part of the team for the specific contract(s). As stated in the instructions, each separate firm on the team should provide a separate Part II as well as the different branch offices of a firm that will be involved (if applicable).

The evaluator should check for the completeness, general accuracy and reasonableness of all information provided.

This Part must be fully completed in order to be marked “yes”. If there are any incomplete Sections in this Part, then this Part must be marked “no”. If an evaluator gives a “no” indication to this Part, the deficiencies must be discussed by the CSC as a whole to determine if the firm is considered satisfactory or not.

The information for this Part is scored as pass or fail. If this Part receives a “no” mark it may be considered incomplete and may cause a firm to receive an overall score of “Fail” for this Part.

## **SPECIAL CRITERIA FORM**

**Applicability:** this form must be used by the Consultant Selection Committee when adding any additional criteria to a Request for Qualifications advertisement. This completed form should be sent to LA DOTD Aviation as part of the Pre-advertisement Document Transmittal.

We the designated Consultant Selection Committee for the \_\_\_\_\_,  
have agreed to include the following criteria in our Request for Qualifications.

Criteria

\_\_\_\_\_

\_\_\_\_\_

The criteria have been included in Advertisement for the Request of Consultant Qualifications. It has also been included on the SOQ Rating Worksheet in the space provided and will be appropriately scored according to the evaluation process.

Signed: \_\_\_\_\_

Print Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Print Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Print Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **\*SAMPLE REQUEST FOR QUALIFICATIONS\***

**Applicability:** This document contains a sample Request for Qualifications that should be used by the Consultant Selection Committee in advertising to receive Statements of Qualifications from interested firms. The sample advertisement is formatted so that the text may simply be copied and revised to fit a particular airport. If the Selection Committee chooses to use its own format, then the sample should be used as a basis for ensuring that the advertisement addresses the appropriate items.

The advertisement must list the criteria to be used for selection, as well as the weight to be applied to each selection criteria. Mention should also be made as to where interested firms may obtain the appropriate forms to be using in submitting Statements of Qualifications.

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### **REQUEST FOR QUALIFICATIONS**

(Date)

Notice is hereby given that the **(Sponsor's Name)** is requesting submittal of qualification statements from engineering firms interested in performing engineering services for the following project.

**(Project Name, Location and estimated construction cost)**

#### **SCOPE OF PROJECT**

**(Brief description of the project including any unique features)**

#### **SCOPE OF SERVICES**

**(Include a description of the services involved. For example, this could include topographic surveys and preliminary investigations, preparation of preliminary and final construction plans and specifications, cost estimates, grant management, construction administration, resident inspection and other special services.)**

#### **GENERAL**

Firms interested in performing these services shall furnish statement of qualifications on a Standard Form 330 (SF 330). Interested firms may obtain SF 330 from the Sponsor or from the LADOTD Aviation Section. The criteria and weighting factors to be used by the Sponsor in evaluating responses will be as follows:



- Resumes of the proposed project team (weight value of **\*\*insert value\*\***)
- Example projects which best illustrate the proposed team's qualifications (weight value of **\*\*insert value\*\***)
- Key personnel's participation in past projects (weight value of **\*\*insert value\*\***)
- Firm size as related to project magnitude (weight value of **\*\*insert value\*\***)
- **Any additional criteria unique to the project (added by sponsor with LADOTD approval) (weight value of **\*\*insert value\*\***)**

**Scoring of the selection criteria shall be on a numerical scale of 1 to 5, with 5 being the highest possible score and 1 being the lowest possible score. The score for each criterion will be multiplied by its weight factor, which indicates the importance of each criterion as it relates to this contract.**

**For selection criteria without an assigned weight value, the score shall be "pass/fail", with a "fail" rating possibly resulting in the disqualification of the applicant prior to the rating process.**

Following the evaluation of the Statements of Qualifications received by the Sponsor's selection committee, the top three (3) applicants will be placed on a short list. It shall be the option of the Sponsor, if the sponsor or selection committee feels further evaluation of the qualified short list applicants is necessary in order to determine the top-ranked firm, to issue a Request for Proposals (RFP) to all short list applicants. The RFP issued to all short list applicants shall contain instructions on the format (such as written proposal, interview, presentation, etc.) to be used in submitting proposals and information on how the proposals will be evaluated.

Following the final evaluation of qualified applicants, the Sponsor will place the applicants in a final ranking based on qualifications. The Sponsor will then enter fee negotiations with the top-ranked firm for the contract, with the unsuccessful firms being notified accordingly. Should these negotiations be unsuccessful, the Sponsor shall enter negotiations with the next-highest ranked firm, and so on. The Sponsor reserves the right to reject all applicants and re-advertise for the contract.

Following the successful negotiation of fees with the Sponsor, the successful firm will be required to execute the standard LADOTD Aviation Section contract.

The Statement of Qualification form, SF 330, shall be mailed or delivered to **(Sponsor's Address)**. Statements of Qualifications will be accepted until **(provide time and date)**.

**Questions regarding this project should be addressed to (include name and phone number of person familiar with the project). Firms wishing to apply must submit a fully completed SF 330. Failure to provide all information requested may result in the submission being considered non-responsive and the firm will not be given a total score in the evaluation process.**

**(Name and Address of Sponsor)**

## **PRE-ADVERTISEMENT DOCUMENTATION TRANSMITTAL FORM**

**Applicability:** This document is to be used by the Consultant Selection Committee in transmitting required documents to LA DOTD Aviation Section as part of the Louisiana Airport Consultant Selection Process. This completed form, along with the documents listed below, must be transmitted to LA DOTD Aviation Section for review and comment prior to the Selection Committee proceeding to advertise for a Request for Qualifications from interested firms.

TO: \_\_\_\_\_ (Designated DOTD Contact)

FROM: \_\_\_\_\_ (Designated Selection Committee Contact)

RE: Documentation Transmittal for Consultant Selection Process

Enclosed for your file are the following items concerning our Consultant Selection Process associated with the Request for Qualifications to be advertised in the Baton Rouge The Advocate and .

\_\_\_ Completed Consultant Selection Committee Member Forms

\_\_\_ Additional Criteria, if any (Use Special Criteria Form)

\_\_\_ SOQ Rating Sheet w/ Selection Criteria Weights Completed

\_\_\_ Proposed Advertisement for Statements of Qualifications

Please contact me at \_\_\_\_\_ if you have any questions concerning these enclosures.

**CONSULTANT QUALIFICATIONS RANKING WORKSHEET**  
**Scores (By Committee Member)**

EVALUATOR:					
CONSULTANT	SCORE	SCORE	SCORE	TOTAL SCORE	RANK

---

NAME/TITLE

## REQUEST FOR PROPOSALS (RFP) RATING SHEET

**APPLICABILITY:** to be used by the Consultant Selection Committee in evaluating the proposals received. A rating sheet should be completed for each proposal received by the committee. When the Committee elects to create its own Rating System, a rating sheet based on the Committee's Rating System should be provided.

Name of Committee Member: \_\_\_\_\_

Name of Firm Being Rated: \_\_\_\_\_

PROPOSAL RATINGS					
Criteria	Rating		Weight		TOTAL SCORE
Proposed Project Phasing		x			
Proposed Project Timeline					
Proposed Funding Approach		x			
Technical Approach		x			
Additional Criteria		x			
<b>Average Rating</b>		x		=	

<b>OVERALL SCORE OF FIRM</b>	
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## **Request for Proposals Rating Worksheet**

**Applicability:** to be used in conjunction with the LA DOTD Request for Proposals Rating Sheet and the firms' proposals for the selection of consultants by a Qualifications Based Selection process. This worksheet provides guidance to the Consultant Selection Committee (CSC) on evaluating the proposals received in response to the Request for Proposals and will aid the Consultant Selection Committee in completing the Request for Proposals (Request for Proposals) Rating Sheet.

**While the CSC should use this worksheet and corresponding rating sheet as a basic minimum set of standards to structure the Request for Proposals, the CSC is free to expand upon the items set forth in this worksheet in developing its own Request for Proposals and Rating System. LA DOTD Aviation will review the CSC's Request for Proposals and Rating System prior to the Committee sending it to firms on the pre-selection short-list to ensure compliance with basic standards.**

**Whatever method is chosen by the CSC in requesting proposals from the firms on the pre-selection short-list, the Committee must ensure that the process is conducted in a uniform manner for all firms involved in the process. Every firm must be provided with all selection criteria, along with the corresponding importance of each, to be used in evaluations. All firms must also be given the same opportunities to present their qualifications and experience to the CSC as well.**

Adherence to the LA DOTD Aviation Consultant Selection Process will ensure compliance with all applicable Federal Aviation Administration regulations and requirements regarding procurement of professional services, and is required for any proposed contracts with LA DOTD receiving funding from the Aviation Trust Fund.

### **Key Terms:**

- Standard Form 330 (SF 330): a form used by Federal agencies to receive statements of qualifications when procuring professional services, which is authorized for local reproduction. LADOTD Aviation Section has chosen this form for use by airport sponsors when selecting consultant firms for projects eligible for FAA or LADOTD Aviation funding.
- Consultant Selection Committee (CSC): a committee formed by the airport sponsor, in accordance with LADOTD policy, for the purpose of selecting a consultant firm when the airport sponsor is seeking FAA or LADOTD Aviation funding for eligible airport projects.
- Request for Proposals (RFP) Rating Sheet: a rating sheet developed by LADOTD Aviation Section to enable the CSC to rate the proposals of each firm submitting a Proposal for a proposed contract.

- Qualifications Based Selection (QBS) Process: a process by which a firm is selected according to its qualifications as opposed to a fee-based selection process. In the QBS process, fees are only discussed after the top firm is selected and is done through a fee negotiation process.

## **RATING OF PROJECT PROPOSALS**

The rating of the proposals received in response to the Request for Proposals should be focused on the reviewers' evaluations of firms' proposals for the completion of the advertised projects.

The RFP should request, at minimum, the following information:

- Proposed phasing of project(s)
- Proposed timeline for project(s) development
- Proposed funding approach to project development
- Proposed technical approach
- Any other pertinent information

As with the Statements of Qualifications, the different criteria to be scored in the proposals should be given a weight reflecting its importance.

**Scoring:** The score for each criterion should reflect the firm's effectiveness at demonstrating its effectiveness at accomplishing the sponsor's goals for each project. Each score will be multiplied by the appropriate weight, and the resulting total scores will be added to arrive at a final overall score.

## **\*SAMPLE REQUEST FOR PROPOSALS\***

**Applicability:** This document contains a sample Request for Proposals (RFP) that should be used by the Consultant Selection Committee in requesting proposals from firms on the pre-selection short list. The sample proposal is formatted so that the text may simply be copied and revised to fit a particular airport. If the Selection Committee chooses to use its own format, then the sample should be used as a basis for ensuring that the advertisement addresses the appropriate items.

The RFP must clearly state the required format of the proposals, and must do so specifically rather than generally so that the request produces proposals that can be uniformly evaluated. The format of proposal can be an interview (formal or informal), presentation (formal or informal), or written.

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### **REQUEST FOR QUALIFICATIONS**

(Date)

Notice is hereby given that the (**Sponsor's Name**) is requesting submittal of qualification statements from engineering firms interested in performing engineering services for the following project.

**(Project Name, Location and estimated construction cost)**

### **SCOPE OF PROJECT**

**(Brief description of the project including any unique features)**

### **SCOPE OF SERVICES**

**(Include a description of the services involved. For example, this could include topographic surveys and preliminary investigations, preparation of preliminary and final construction plans and specifications, cost estimates, grant management, construction administration, resident inspection and other special services.)**

## GENERAL

Firms interested in performing these services shall submit proposals detailing the following:  
follows:

- Proposed phasing of the project(s)
- Proposed timeline of project(s) completion
- Proposed funding approach for the project(s)
- Proposed technical approach to completing the project
- **Any additional criteria unique to the project (added by sponsor with LADOTD approval) (weight value of \*\*insert value\*\*)**

**Scoring of the proposals shall be in the areas previously mentioned and on a numerical scale of 1 to 5, with 5 being the highest possible score and 1 being the lowest possible score. The score for each area of evaluation will be multiplied by its weight factor, which indicates the importance of each criterion as it relates to this contract.**

**For selection criteria without an assigned weight value, the score shall be “pass/fail”, with a “fail” rating possibly resulting in the disqualification of the applicant prior to the rating process.**

Following the evaluation of the Proposals received by the Sponsor’s selection committee, the applicant firms will be placed in a ranking based on the combined final score of a firm’s qualifications and proposal.

Following the recommendation and acceptance of the top-ranked firm the Sponsor will then enter fee negotiations with the top-ranked firm for the contract, with the unsuccessful firms being notified accordingly. Should these negotiations be unsuccessful, the Sponsor shall enter negotiations with the next-highest ranked firm, and so on. The Sponsor reserves the right to reject all applicants and re-advertise for the contract.

Following the successful negotiation of fees with the Sponsor, the successful firm will be required to execute the standard LADOTD Aviation Section contract.

The Proposals shall be mailed or delivered to **(Sponsor's Address)**. Proposals will be accepted until **(provide time and date)**.

**Questions regarding this project should be addressed to (include name and phone number of person familiar with the project). Firms wishing to apply must submit a Proposal in accordance with the sponsor’s instructions. Failure to provide all information requested may result in the submission being considered non-responsive and the firm will not be given a total score in the evaluation process.**

**(Name and Address of Sponsor)**



## PRE-RFP DOCUMENTATION TRANSMITTAL FORM

**Applicability:** This document is to be used by the Consultant Selection Committee in transmitting required documents to LA DOTD Aviation Section as part of the Louisiana Airport Consultant Selection Process. This completed form, along with the documents listed below, must be transmitted to LA DOTD Aviation Section for review and comment prior to the Selection Committee proceeding to advertise for a Request for Proposals from interested firms.

TO: \_\_\_\_\_ (Designated DOTD Contact)

FROM: \_\_\_\_\_ (Designated Selection Committee Contact)

RE: Documentation Transmittal for Consultant Selection Process

Enclosed for your file are the following items concerning our Consultant Selection Process associated with the Request for Qualifications first advertised in the Baton Rouge The Advocate and .

\_\_\_ Completed Statement of Qualifications Rating Sheets

\_\_\_ Completed Consultant Qualifications Ranking Sheet

\_\_\_ Short List of Qualified Firms (at least three)

\_\_\_ Notification Letters to Unsuccessful Firms

\_\_\_ Request for Proposals

Please contact me at \_\_\_\_\_ if you have any questions concerning these enclosures.

Enclosures

**CONSULTANT PROPOSALS RANKING WORKSHEET**  
**Scores (By Committee Member)**

EVALUATOR:						
CONSULTANT	RFP SCORE	RFP SCORE	RFP SCORE	QUALIFICATIONS SCORE	TOTAL SCORE	FINAL RANK

**SAMPLE NOTIFICATION LETTER TO OTHER FIRMS****\*\*\*(FOR FIRMS NOT SELECTED TO ENTER THE RFP PROCESS)**

Re: Consultant Selection Process  
(Name of Project)

Dear \_\_\_\_\_:

We are writing to advise you that your firm was not selected to submit a proposal to \_\_\_\_\_ (sponsor name or the DOTD) for \_\_\_\_\_ (name of advertised project).

Following a qualifications-based selection process, the firms selected to the Pre-Application Short-List (in no particular order) are as follows:

1. \_\_\_\_\_ (FIRM #1)
2. \_\_\_\_\_ (FIRM #2)
3. \_\_\_\_\_ (FIRM #3)

We appreciate your firm's interest in our airport and in this project.

Very truly yours,

\_\_\_\_\_  
Consultant Selection Committee

cc: LDOTD

**SAMPLE NOTIFICATION LETTER TO OTHER**

**\*\*(FOR FIRMS NOT SELECTED AS TOP FIRM FOR EVALUATIONS AFTER QUALIFICATIONS AND/OR RFP IS EVALUATED)**

Re: Consultant Selection Process  
(Name of Project)

Dear \_\_\_\_\_:

We are writing to advise you that your firm was not selected to enter into negotiations with (sponsor name or the DOTD) for (name of advertised project).

Following a qualifications-based selection process, the top three firms, ranked in descending order, are as follows:

1. (FIRM #1)
2. (FIRM #2)
3. (FIRM #3)

Should negotiations fail with the top ranked firm, the #2-ranked firm will be invited to negotiate, then if needed, the #3-ranked firm, until negotiations can be satisfactorily concluded.

We appreciate your firm's interest in our airport and in this project.

Very truly yours,

\_\_\_\_\_  
Consultant Selection Committee

cc: LDOTD

**SAMPLE NOTIFICATION LETTER TO SHORT LIST FIRMS (RFP)****\*\*\*(FOR FIRMS SELECTED TO THE PRE-APPLICATION SHORT LIST)**

Re:     Consultant Selection Process  
       (Name of Project)

Dear \_\_\_\_\_:

We are pleased to advise you that your firm has been selected to submit a proposal to \_\_\_\_\_ (sponsor name or the DOTD) \_\_\_\_\_ for \_\_\_\_\_ (name of advertised project) \_\_\_\_\_.

Your firm was one of \_\_\_\_\_ firms selected to the Pre-Selection Short-List from a field of respondents. This selection was \_\_\_\_\_ based upon evaluation scores of the Statement of Qualifications. The firms selected to the Pre-Selection Short-List, in no particular order, are as follows:

1.     \_\_\_\_\_(FIRM #1)\_\_\_\_\_
2.     \_\_\_\_\_(FIRM #2)\_\_\_\_\_
3.     \_\_\_\_\_(FIRM #3)\_\_\_\_\_

We will be contacting you shortly regarding preparation of a proposal for this project. Thank you for your interest in this project.

Very truly yours,

\_\_\_\_\_  
Consultant Selection Committee

cc:DOTD

**SAMPLE NOTIFICATION LETTER TO TOP RANKED FIRM FOR NEGOTIATIONS****\*\*\* (FOR TOP FIRM AFTER QUALIFICATIONS AND/OR RFP ARE EVALUATED)**

Re: Consultant Selection Process  
(Name of Project)

Dear \_\_\_\_\_:

We are pleased to advise you that your firm has been selected to enter into negotiations with (sponsor name or the DOTD) \_\_\_\_\_ for (name of advertised project) \_\_\_\_\_.

Your firm was ranked first from a field of \_\_\_\_\_ respondents. The top three firms, ranked by their evaluation scored in descending order are as follows:

1. \_\_\_\_\_ (FIRM #1)
2. \_\_\_\_\_ (FIRM #2)
3. \_\_\_\_\_ (FIRM #3)

We will be contacting you shortly regarding preparation of a fee proposal for this project. Thank you for your interest in this project.

Very truly yours,

\_\_\_\_\_  
Consultant Selection Committee

cc:DOTD

## **PRE-CONTRACT DOCUMENTATION TRANSMITTAL FORM**

**Applicability:** This document is to be used by the Consultant Selection Committee in transmitting required documents to LA DOTD Aviation Section as part of the LA DOTD Aviation Section Consultant Selection Policy. This completed form, along with the documents listed below, must be transmitted to LA DOTD Aviation Section for review and comment prior to the Airport Sponsor awarding a contract to the successful firm.

TO: \_\_\_\_\_ (Designated DOTD Contact)

FROM: \_\_\_\_\_ (Designated Selection Committee Contact)

RE: Documentation Transmittal for Consultant Selection Process

Enclosed for your file are the following items concerning our Consultant Selection Process associated with the Request for Qualifications first advertised in the Baton Rouge The Advocate dated .

- \_\_\_ Proof of Advertisement
- \_\_\_ Completed Statement of Qualifications Rating Sheets (if not previously submitted)
- \_\_\_ Completed Consultant Qualifications Ranking Sheet (if not previously submitted)
- \_\_\_ Completed RFP Rating Sheets (if applicable)
- \_\_\_ Completed Consultant Proposal Ranking Sheet (if applicable)
- \_\_\_ Notification Letters (as applicable)
- \_\_\_ Notification to Top-Ranked Firm to Prepare Fee Estimate
- \_\_\_ Independent Fee Estimate (if applicable)
- \_\_\_ Record of Negotiations
- \_\_\_ Letter of Recommendation to Award to Selected Firm
- \_\_\_ Draft Engineering Services Agreement (ESA)

Please contact me at \_\_\_\_\_ if you have any questions concerning these enclosures.

## **GENERAL CHECKLIST**

**Applicability:** This checklist is to be used by the Consultant Selection Committee in proceeding through the Louisiana Airport Consultant Selection Process. Adherence to the steps contained in this document is vital to ensuring that the LA DOTD Aviation Section will remain informed and can offer proper guidance throughout the process and ensure the Airport Sponsor's compliance with all applicable regulations and policies.

<u>DONE</u>	<u>N/A</u>		
_____	_____	Step 1.	Establish contact with the LA DOTD Aviation Section
_____	_____	Step 2.	Determine if your proposed project is included in a current engineering services agreement with a consultant selected in accordance with LA DOTD Aviation policy
_____	_____	Step 3.	Determine if the procurement for professional services will be for single or multiple projects (i.e. Master Services Agreement)
_____	_____	Step 4.	If advertising for multiple projects, identify first anticipated projects
_____	_____	Step 5.	Form Your Consultant Selection Committee
_____	_____	Step 6.	Establish your Selection Criteria and Criteria Value
_____	_____	Step 7.	Create Request for Qualifications
_____	_____	<b>Step 8.</b>	<b>Submit Pre-Advertisement Document Transmittal Form with supporting documentation</b>
<hr/>			
_____	_____	Step 9.	Receive LA DOTD review of Pre-Advertisement Document Transmittal
_____	_____	Step 10.	Begin advertising to receive Statements of Qualifications (minimum 14 days, preferably 30 days. MUST appear in Baton Rouge Advocate)
_____	_____	Step 11.	Review and rate Statements of Qualifications
_____	_____	Step 12.	Create Pre-Selection Short-List of qualified firms
_____	_____	Step 13.	If selecting based on SOQ's only go to Step. If not go to step 14.
_____	_____	Step 14.	Create RFP to send to firms on short list
_____	_____	<b>Step 15.</b>	<b>Submit Pre-RFP Document Transmittal Form with supporting documents</b>
<hr/>			
_____	_____	Step 16.	Receive LA DOTD review of Pre-RFP Document Transmittal
_____	_____	Step 17.	Notify all non-short list firms they were unsuccessful
_____	_____	Step 18.	Request and receive proposals from firms on short list



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_____	_____	Step 19.	Review proposals and identify top-ranked firm
_____	_____	Step 20.	Enter discussions with top-ranked firm to develop scope
_____	_____	Step 21.	Direct top-ranked firm to prepare fee proposal (based on first anticipated project if procuring for multiple projects)
_____	_____	Step 22.	Conduct fee negotiations (based on first anticipated project if procuring for MSA)
_____	_____	Step 23.	Prepare draft contract and record of negotiations
_____	_____	Step 24.	If contract will exceed \$100,000, or if otherwise required by LA DOTD and/or FAA, prepare and submit fee analysis in accordance with current standards
_____	_____	<b>Step 25.</b>	<b>Submit Pre-Contract Document Transmittal Form with supporting documents</b>

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_____	_____	Step 26.	Receive LA DOTD review of Pre-Contract Document Transmittal
_____	_____	Step 26.	Execute the Contract

## **GLOSSARY of Aviation Terms**

AC	Air Carrier or Advisory Circular
AFD	Airport Facility Directory
AIP	Airport Improvement Program or Aeronautical Information Publication
ALP	Airport Layout Plan
ALS	Approach Lighting System    An airport lighting facility which provides visual guidance to landing aircraft
ALSF-1	Approach Lighting System with Sequenced Flashing Lights in ILS CAT-I configuration
ALSF-2	Approach Lighting System with Sequenced Flashing Lights in ILS Cat-II configuration
AOA	Aircraft Operational Area
APRON	Parking Area for Aircraft
ASDE	Airport Surface Detection Equipment    Radar equipment specifically designed to detect all principal features on the surface of an airport, including aircraft and vehicular traffic
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar    Approach control radar used to detect and display an aircraft's position in the terminal area.
ATC	Air Traffic Control    A service provided by a control tower for aircraft operating on or in the vicinity of an airport.
ATCT	Air Traffic Control Tower    See ATC
AWOS	Automated Weather Observing System
BRL	Building Restriction Line
CFR	Code of Federal Regulations
COMPASS LOCATOR	A radio beacon installed at the site of the outer or middle marker of an ILS
DBE	Disadvantaged Business Enterprise
DME	Distance Measuring Equipment    Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.
EA	Environmental Assessment
EMAS	
FAR	Federal Aviation Regulation
FIXED BASE OPERATOR	Normally a commercial operator of aviation services on an airport

FSDO	Flight Standards District Office	
GA	General Aviation	That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of public convenience and necessity.
GPS	Global Positioning System	A space based radio positioning, navigation, and time-transfer system.
GS	Glideslope	Provides vertical guidance for aircraft during approach and landing
HIRL	High Intensity Runway Lights	
IFR	Instrument Flight Rules	Rules governing the procedures for conducting instrument flight
ILS	Instrument Landing System	A precision instrument approach system which normally consists of the following electronic components and visual aids:
	Localizer	(See LOC)
	Glideslope	(See GS)
	Outer Marker	(See OM)
	Middle Marker	(See MM)
	Approach Lights	(See ALS, MALSR)
IM	Inner Marker	A marker beacon used with an ILS (CAT II) precision approach located between the Middle Marker and the approach end of the ILS runway.
IMC	Instrument Meteorological Conditions	Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling.
LDIN	Lead-in-Light system	Consists of one or more series of flashing lights installed at or near ground level that provides positive visual guidance along an approach path, either curving or straight, where special problems exist with hazardous terrain, obstructions, or noise abatement procedures
LNAV	Lateral Navigation	A function of area navigation (RNAV) equipment which calculates, displays, and provides lateral guidance to a profile or path
LOC	Localizer	The component of an ILS which provides course guidance to the runway centerline.
LOM	A compass locator installed at the site of the outer marker of an ILS	
MALS	Medium Intensity Approach Lighting System	
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashers	
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	
MASTER PLAN		
MIRL	Medium Intensity Runway Lights	

MITL	Medium Intensity Taxiway Lights
MM	Middle Marker A marker beacon that defines a point along the glideslope of an ILS normally located at or near the point of decision height.
NAVAID	Navigational Aid
NDB	Non-Directional Radio Beacon A radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and “home” on or track to or from the station. When the radio beacon is installed in conjunction with the Instrument Landing System Marker, it is normally called a COMPASS LOCATOR
NOTAM	Notice to Airmen
NPA	Non-Precision Approach A standard instrument approach procedure in which no electronic glideslope is provided
NPIAS	National Plan of Integrated Airport Systems
NP	Non-Precision (See NPA)
OBSTRUCTION REMOVAL	A planned program to remove the obstructions (trees, buildings, ditches, etc) from the RPZ or safety areas.
ODAL	Omnidirectional Approach Lighting System consists of seven omnidirectional flashing lights located in the approach area of a NP runway.
OFA	Object-Free Area
OFZ	Object-Free Zone
OM	Outer Marker A marker beacon at or near the glideslope intercept altitude of an ILS approach. The OM is normally located four to seven miles from the runway threshold on the extended centerline of the runway
OVERLAY	Normally an Asphalt Overlay of two inches, but could be concrete overlay also
PAPI	Precision Approach Path Indicator A visual landing aid that provides precision glideslope information to the pilot enabling the landing approach procedure to be made with enhanced accuracy and safety
PARALLEL TAXIWAY	A Taxiway paralleling a particular runway
PARTIAL PARALLEL TAXIWAY	A partial taxiway paralleling a particular runway
PCI	Pavement Condition Index
PCC	Portland Cementous Concrete
RAIL	Runway Alignment Indicator Lights
RAMP	An acronym for an Apron
RECONSTRUCT	Normally rebuild, i.e. Reconstruct Pavement – another ambiguous term
REHABILITATE	Repair / Overlay / Sealcoat / Crack Seal / or anything else writer intended to mean – very ambiguous

REILS	Runway End Identifier Lights
REJUVINATE	An additive put in with a Sealcoat that replaces lost oils to the asphalt
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RUNWAY	A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length.
SAFETY AREA	
SEALCOAT	Normally a protective surface applied to asphalt pavements
STUB TAXIWAY	
T-HANGAR	Hangars, designed for planes back to back, shaped like a "T"
TAXIWAY	
TERMINAL	
TERMINAL (BUILDING)	
VAULT	Building that houses electrical equipment for an airport